Introduction to git
(git 入門)

Junio C Hamano
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git - a stupid content tracker

- Started by Linus Torvalds in Apr 2005.
- Originally designed for the kernel project.
- Supports:
  - Distributed, highly parallel development style.
  - Large project, many small changes.
- Used by non-kernel projects, too.
  - Wine, xcb, Cairo, U-boot, xmms2,...

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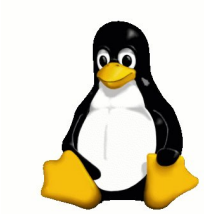
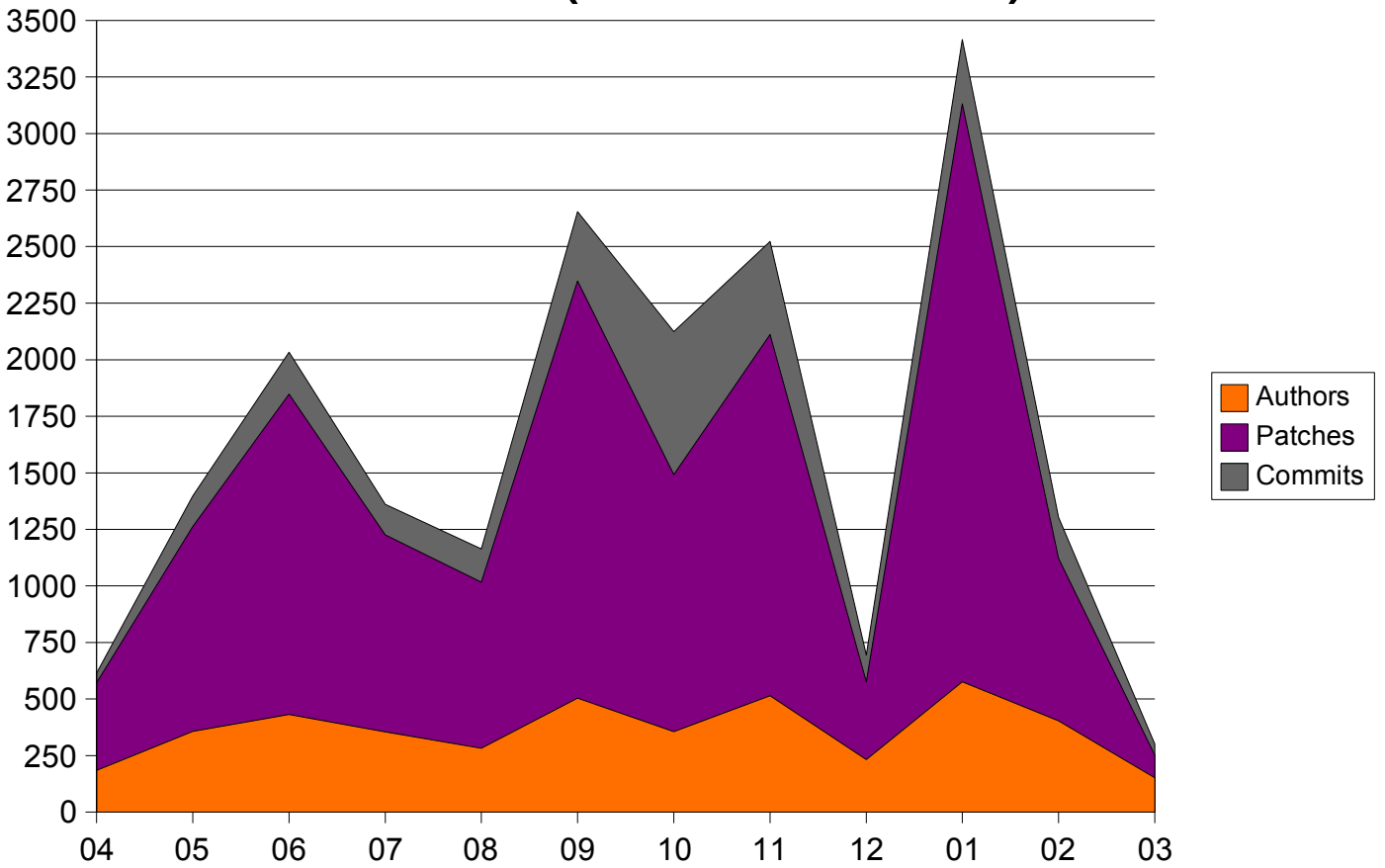
Kernel project is very active

- 100+ contributors (パッチ提供者)
- 1000+ patches/month (毎月何千も)





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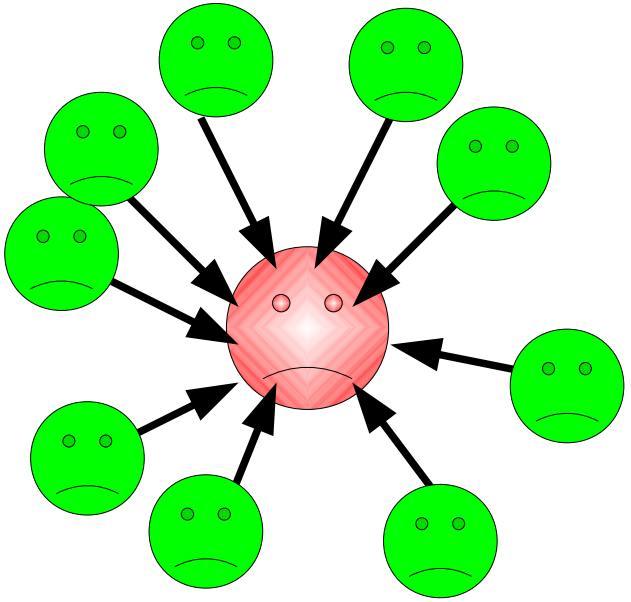
Distribution is the key (分散開発が鍵)

- Working on fixes and enhancements
- Integrating others changes



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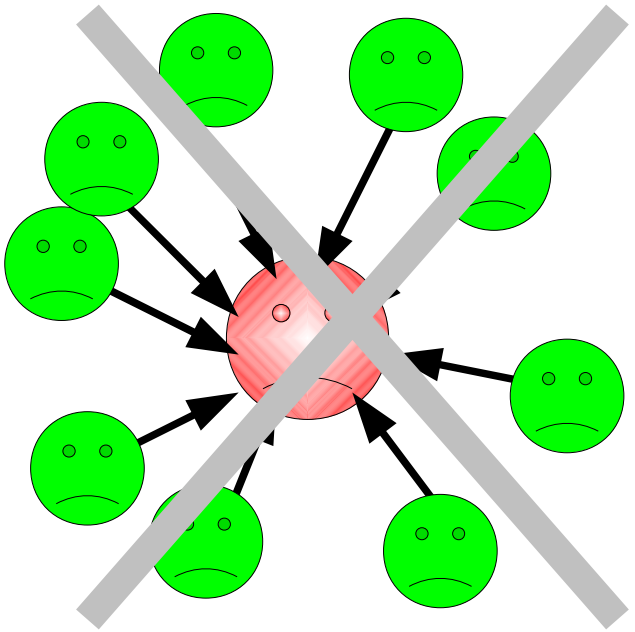

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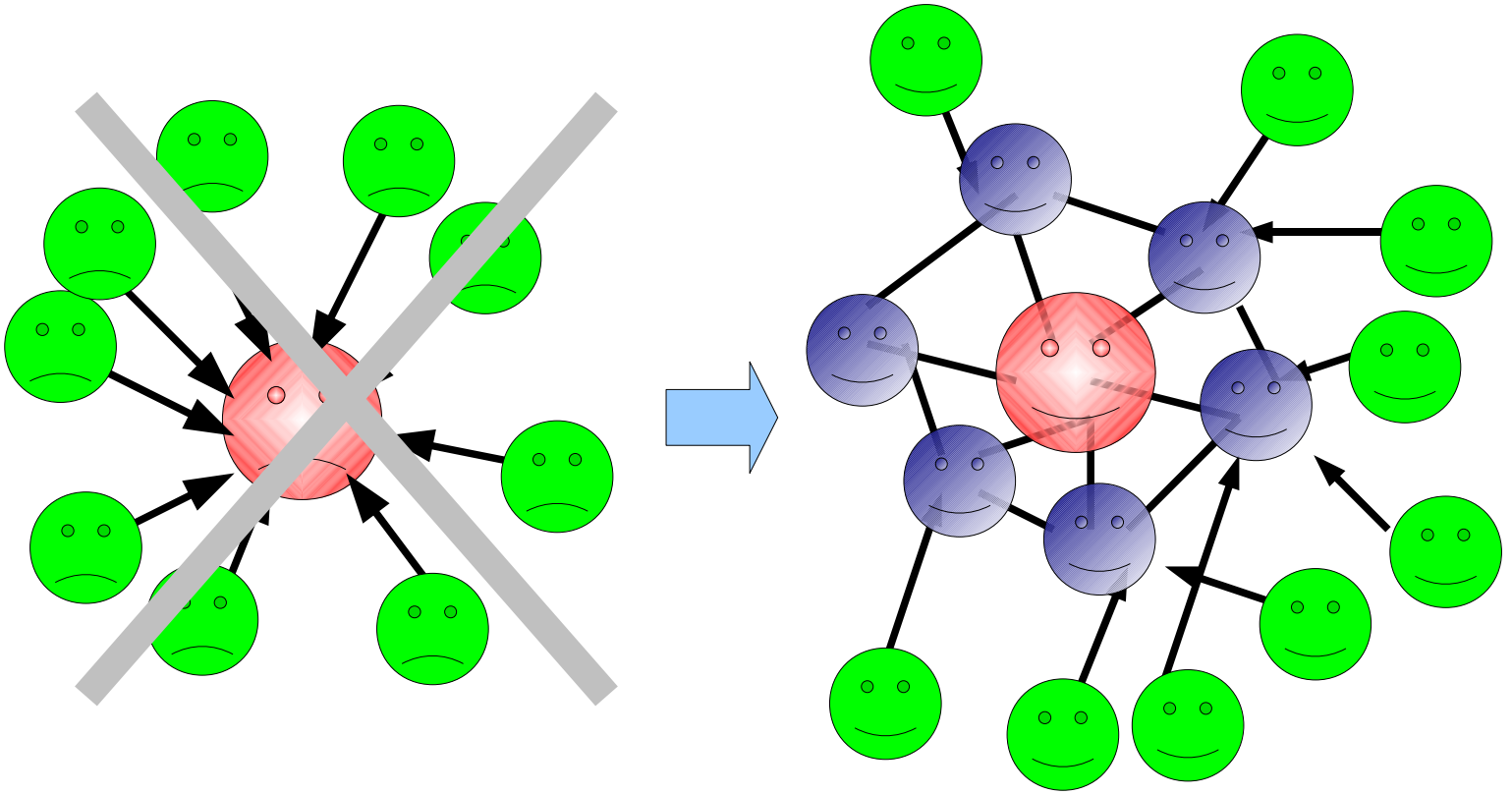

Introduction to git.
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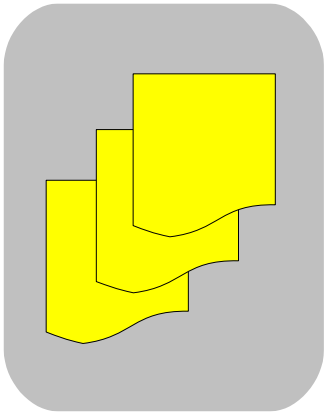
Terminology (用語)

- Tree
  - Project State



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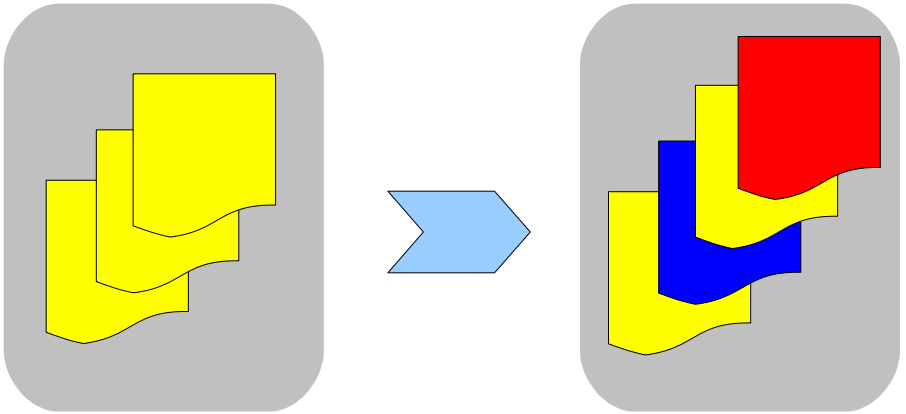
Terminology (用語)

- Tree
  - Project State
- Patch
  - Change between trees



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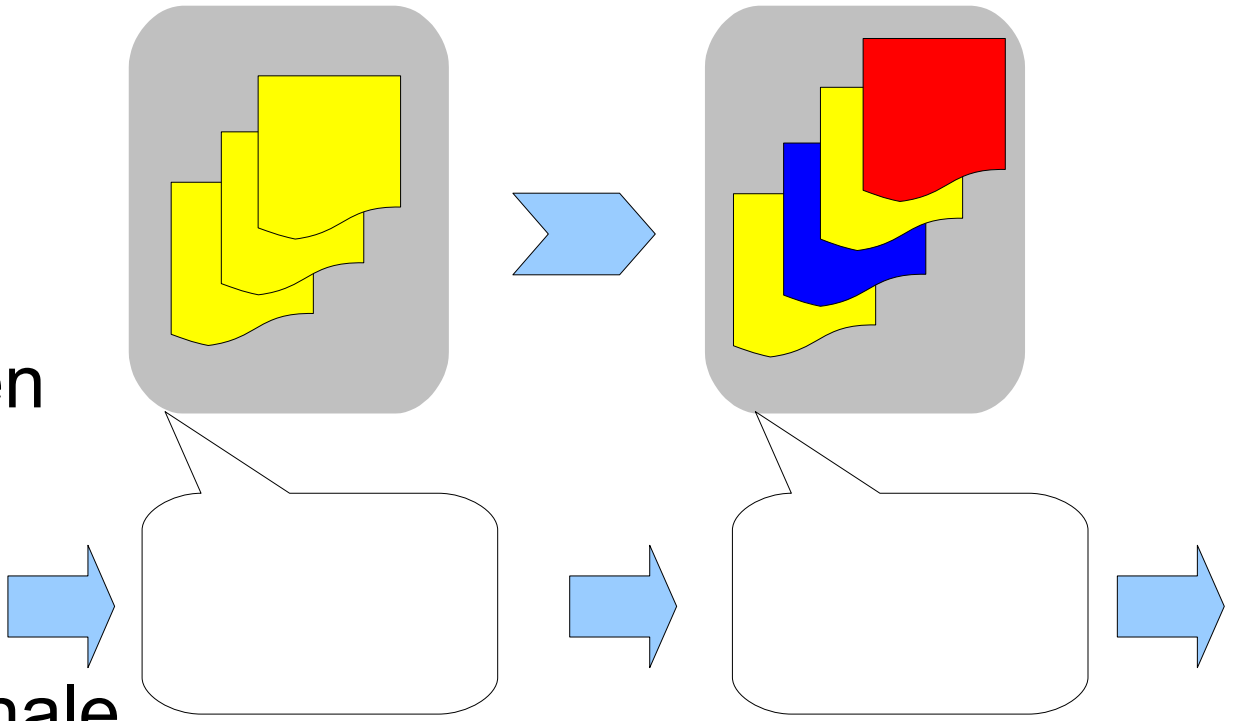
Terminology (用語)

- Tree
  - Project State
- Patch
  - Change between trees
- Commit
  - History & Rationale



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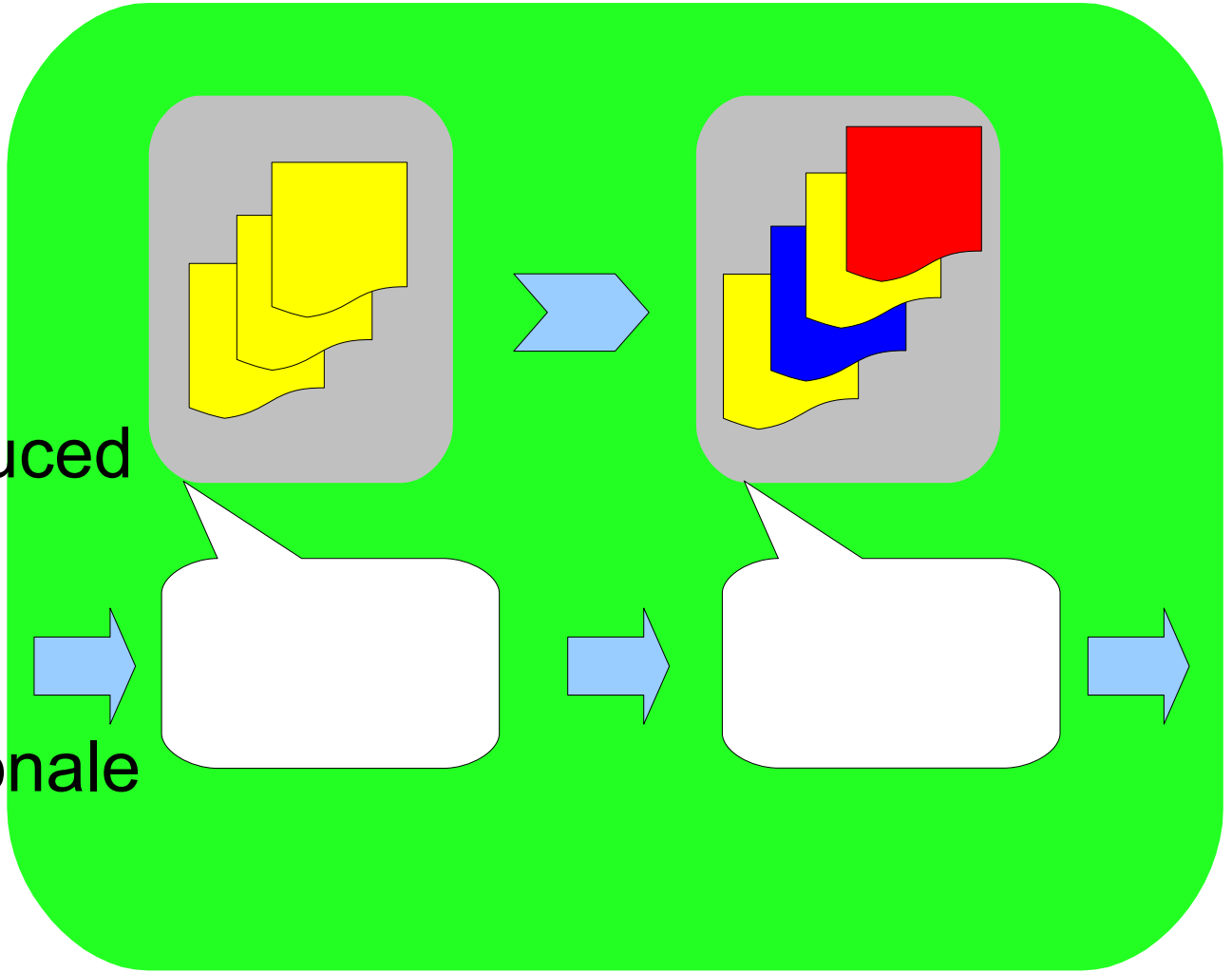
Terminology (用語)

- Tree
  - Project State
- Patch
  - Change introduced by a commit
- Commit
  - History & Rationale
- Repository



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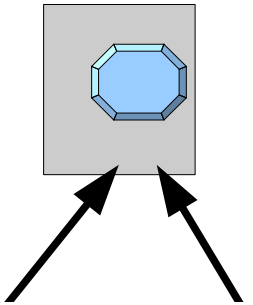
Branching (枝分かれ)

- No single repository is inherently “authoritative”.
  - Linus's tree is authoritative by social convention.



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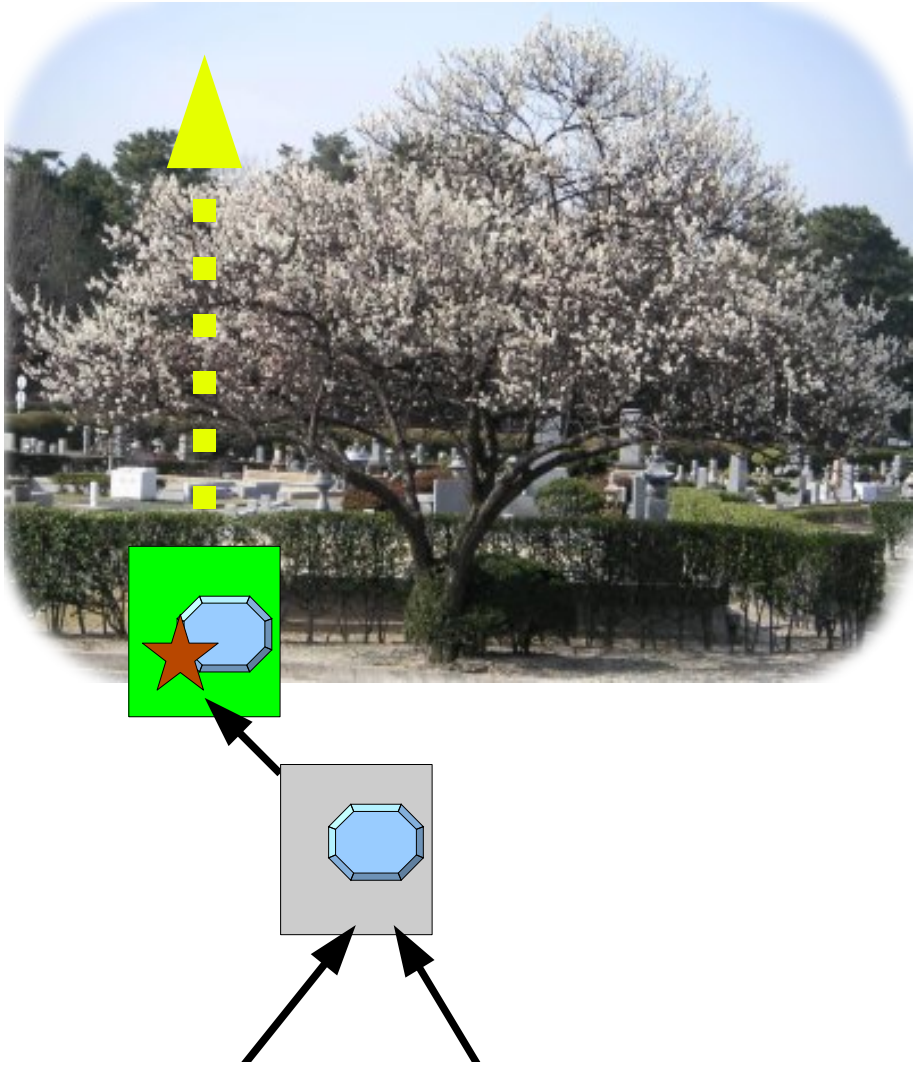
Branching (枝分かれ)

- No single repository is inherently “authoritative”.
- Everybody can fork and make his own changes.
  - Clone a repository
  - Create a branch



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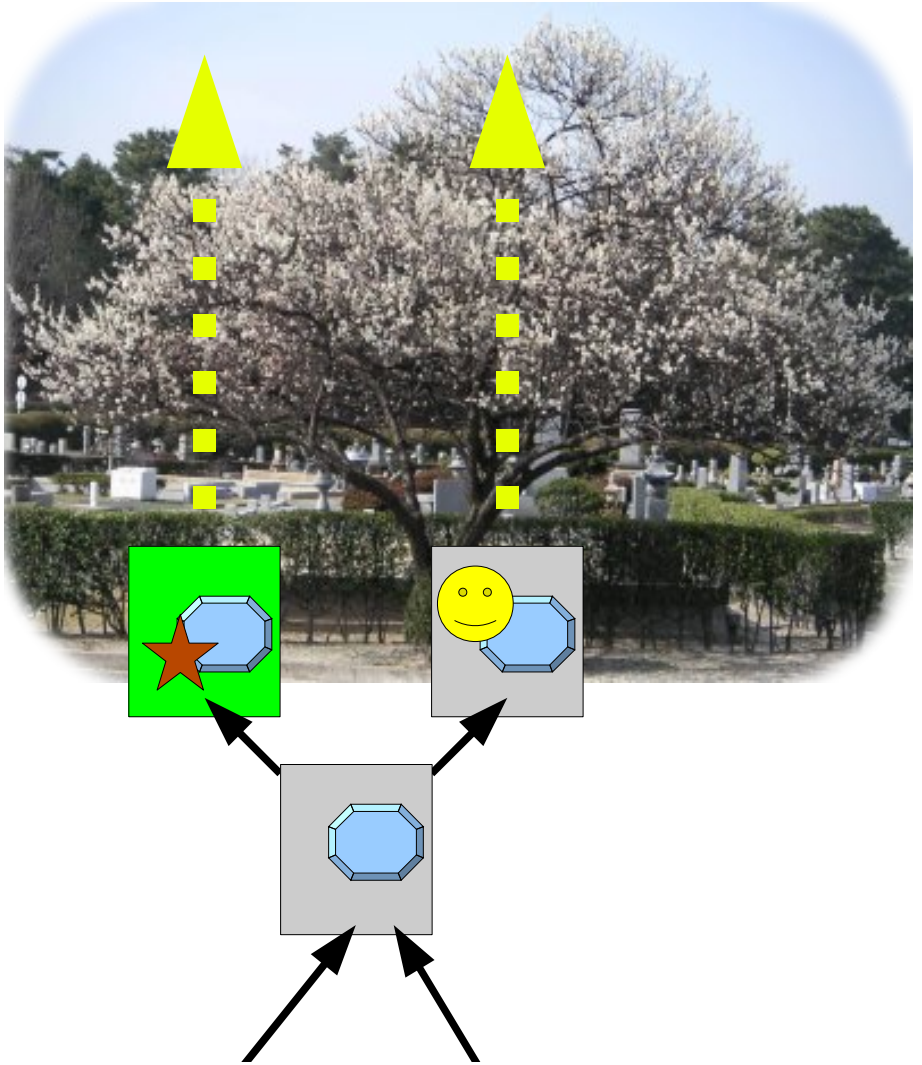
Branching (枝分かれ)

- No single repository is inherently “authoritative”.
- Everybody can fork and make his own changes.
- Typically, a branch is used to work on a single “topic”. (テーマ毎の枝)



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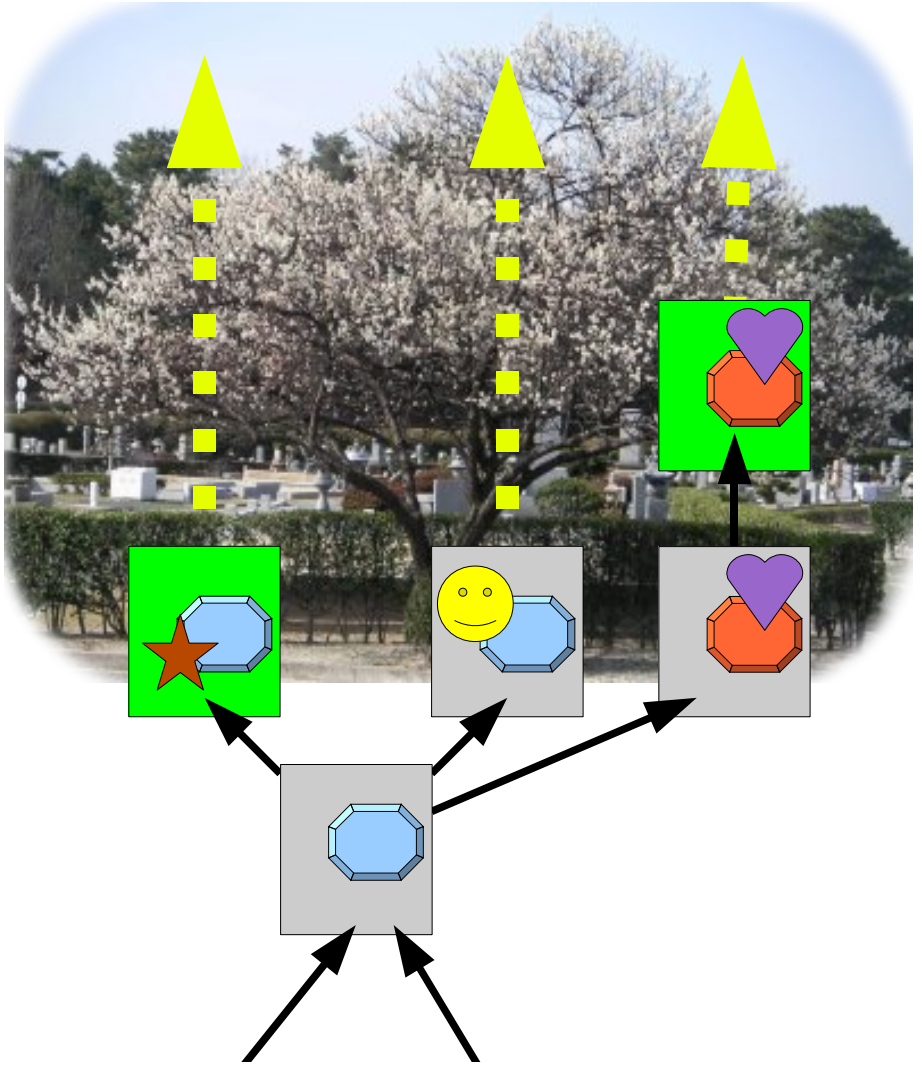

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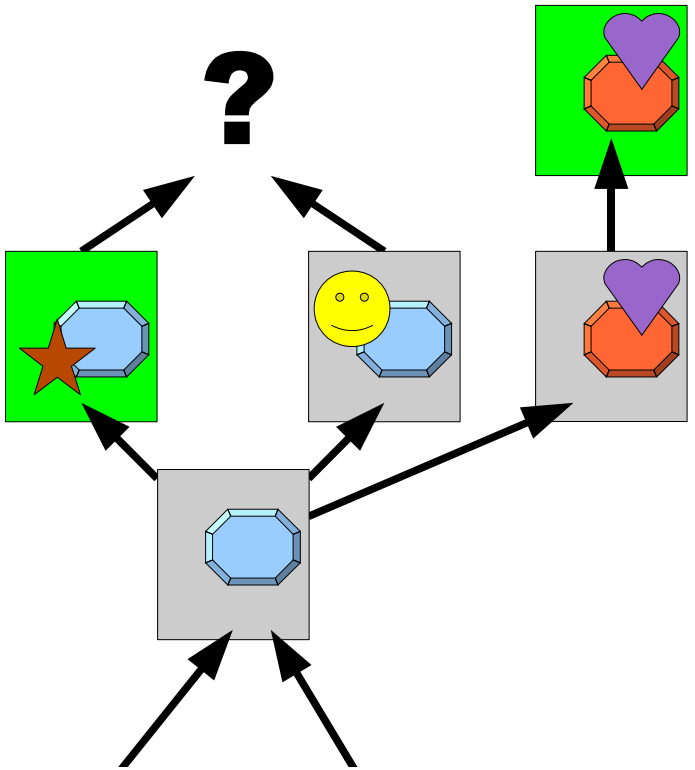
Merging (統合)

- What is a Merge?
  - Given two (or more) different project states, come up with a project state that is more desirable than all of them.
- Consolidate work
  - on different branches
  - often from different people



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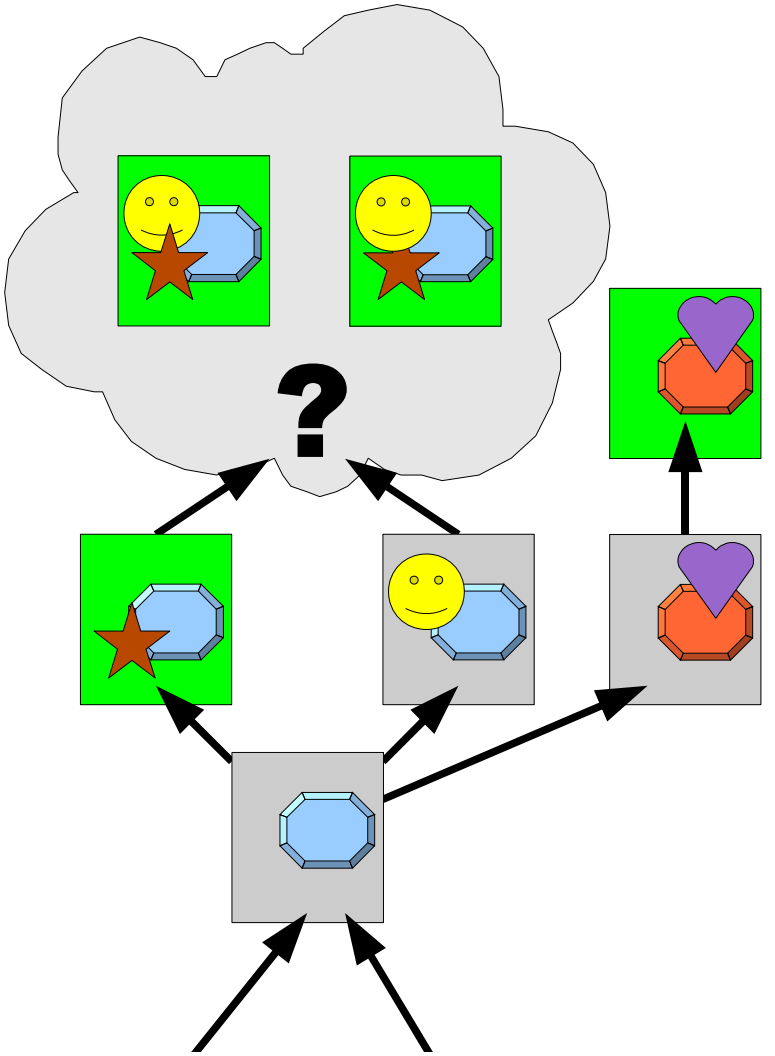
Merging (cont'd)

- Conflicts (競合)
- There is no single “correct” merge.
- Not all merges can be automated.



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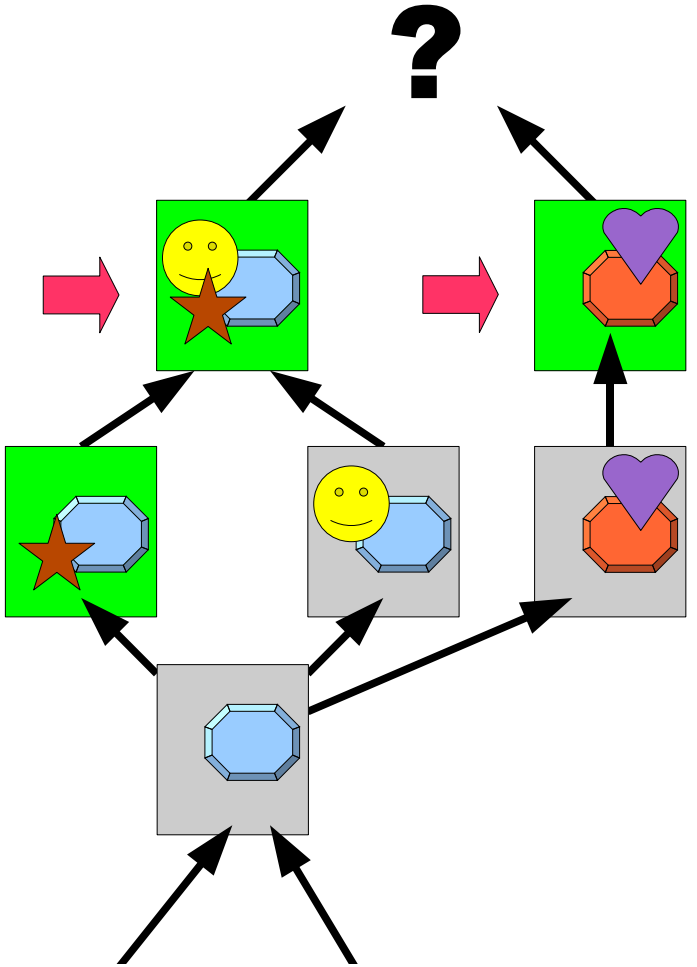
Merging (cont'd)

- git uses the 3-way merge algorithm.



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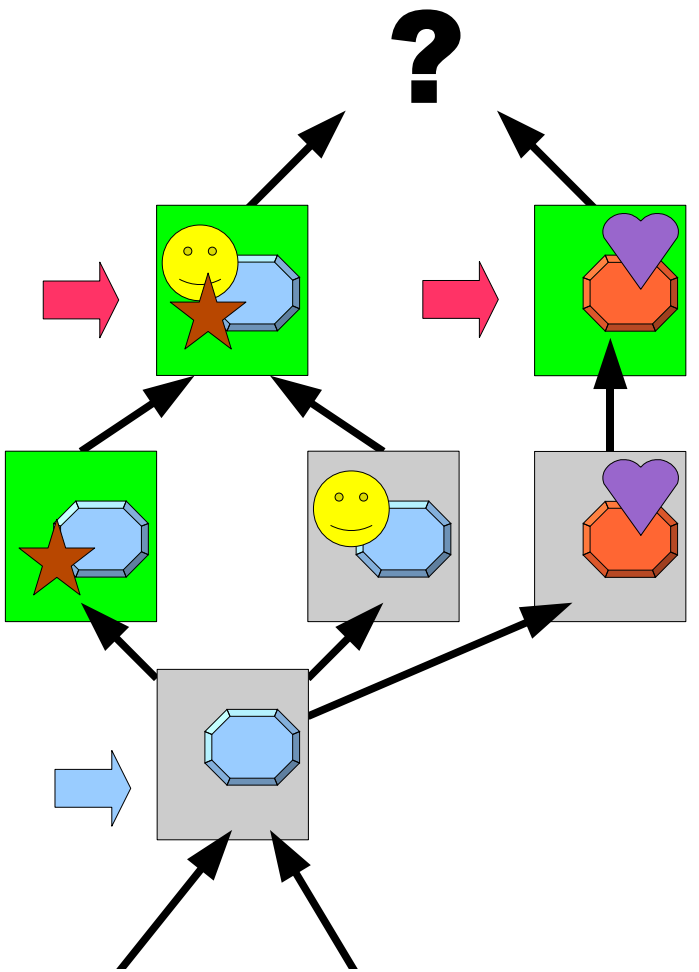
Merging (cont'd)

- git uses the 3-way merge algorithm.
- find a common ancestor



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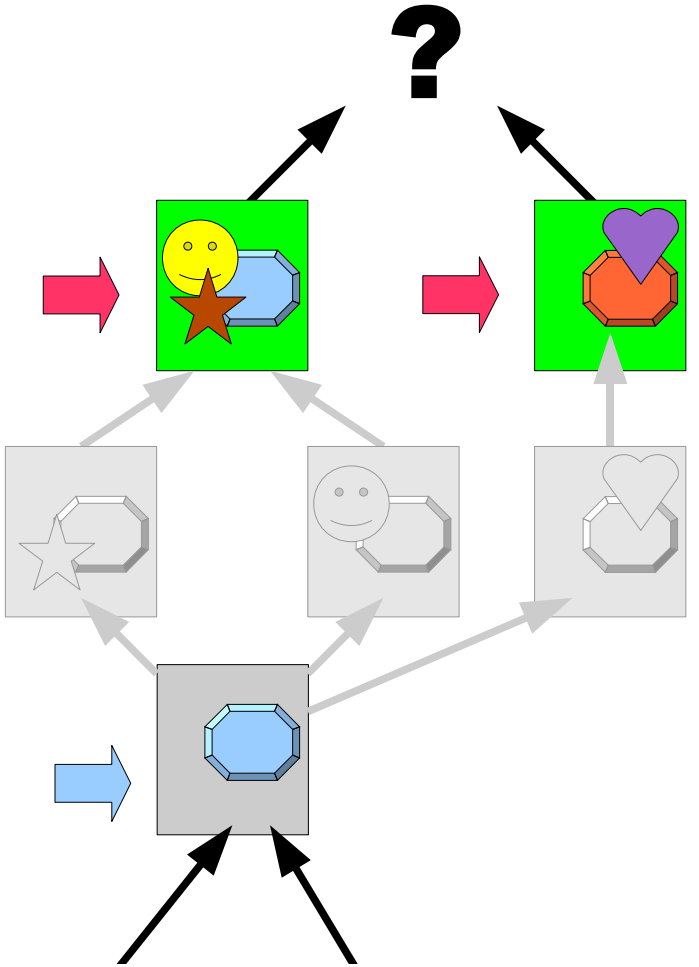
Merging (cont'd)

- git uses the 3-way merge algorithm.
- find a common ancestor
- come up with the result, while looking at only 3 states:



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Merging (cont'd)

- git uses the 3-way merge algorithm.
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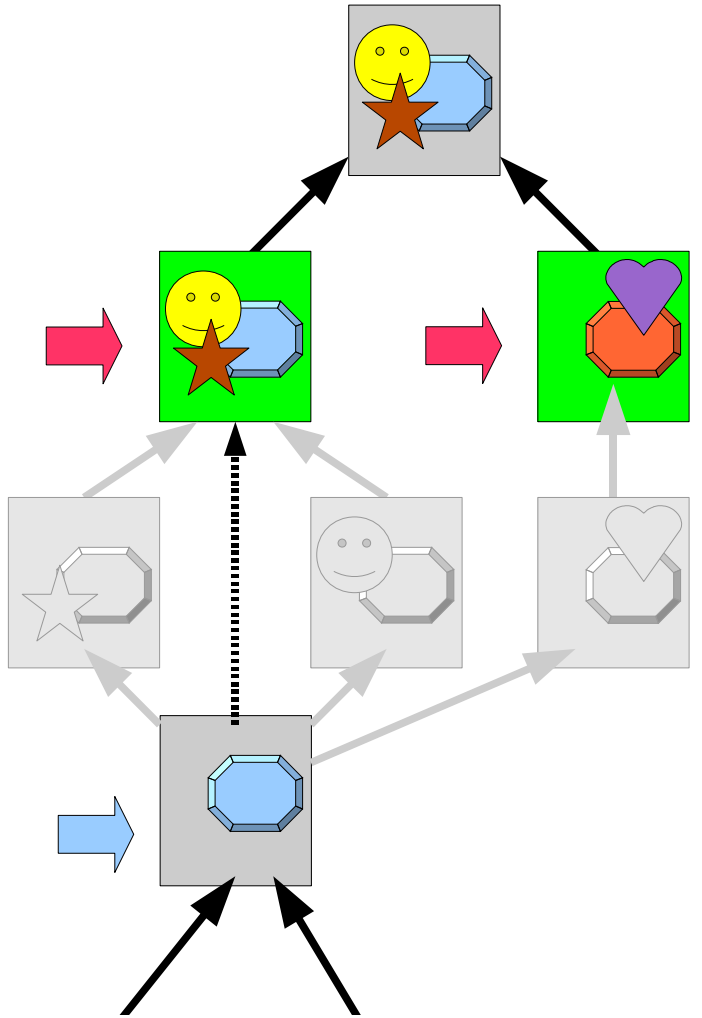
  - if only one-side changes, take that change.



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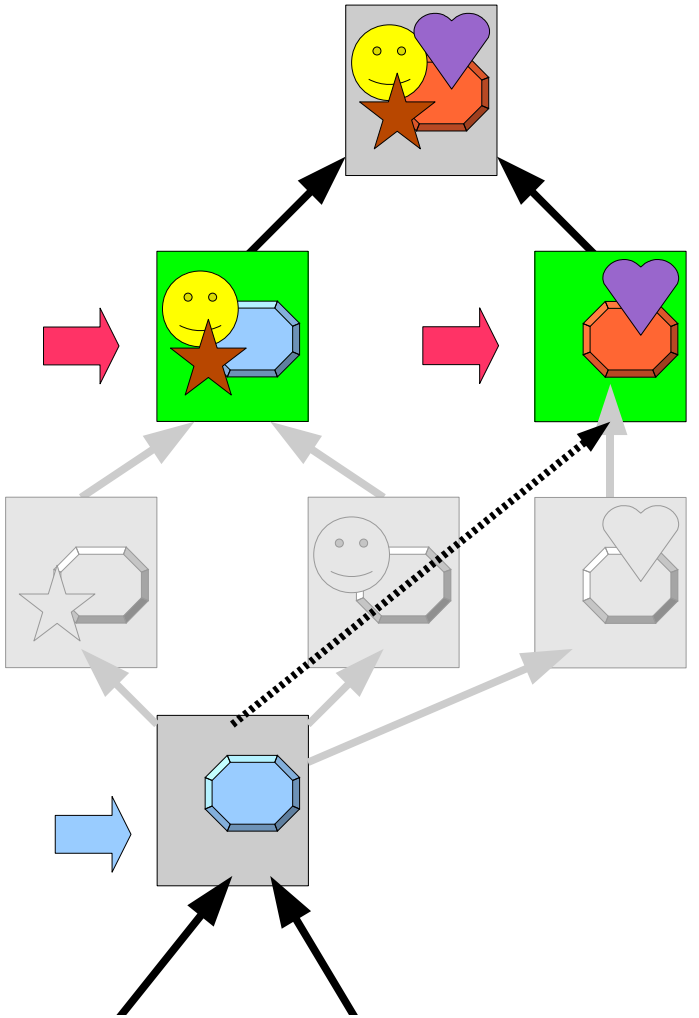

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Merging (cont'd)

- git uses the 3-way merge algorithm.
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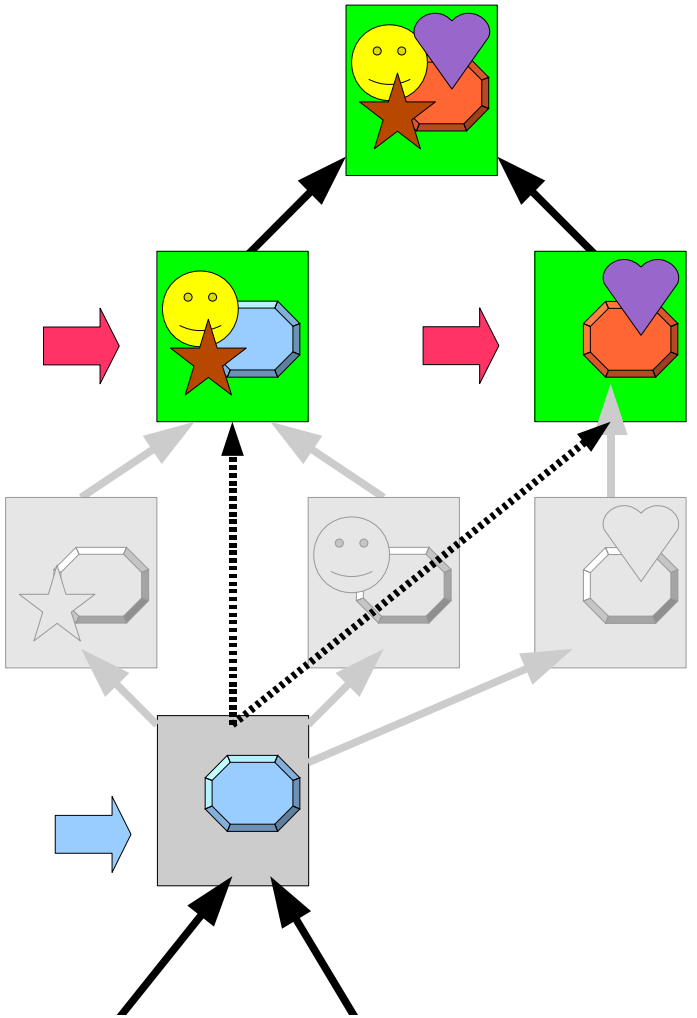

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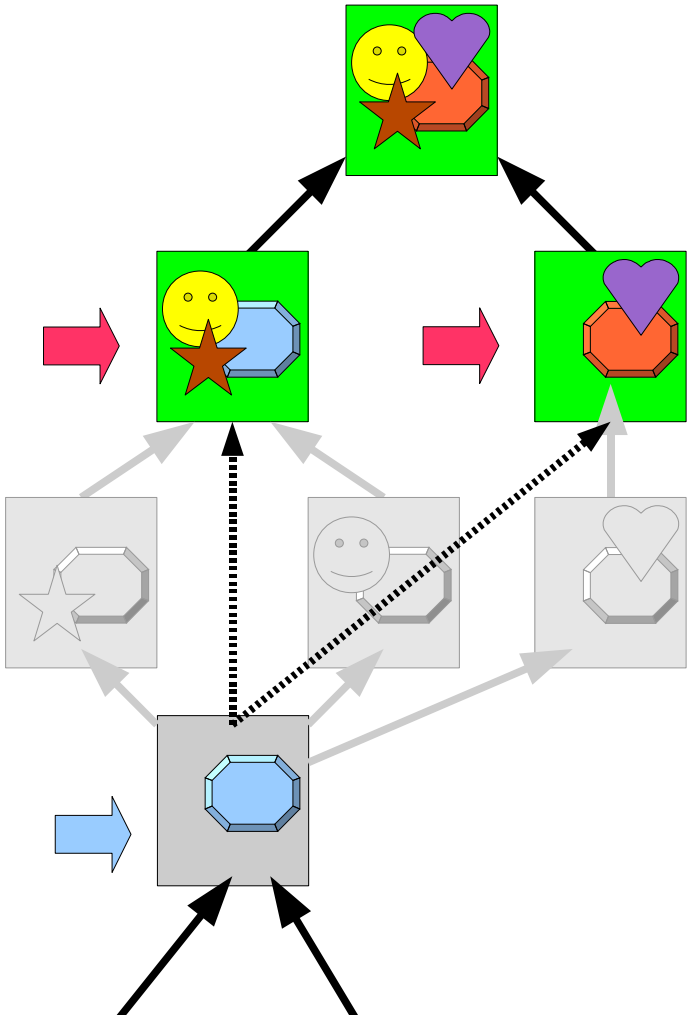
Merging (cont'd)

- git uses the 3-way merge algorithm.
- find a common ancestor
- come up with the result, while looking at only 3 states:
  - if only one-side changes, take that change.
  - if both sides change to the same result, use it.
  - otherwise it is a conflict.



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Archaeology (考古学)

- In a large project, no single person knows everything.
  - Visualization (可視化)
    - gitk, gitview
    - gitweb
    - tig
  - Bisection (二分探索).

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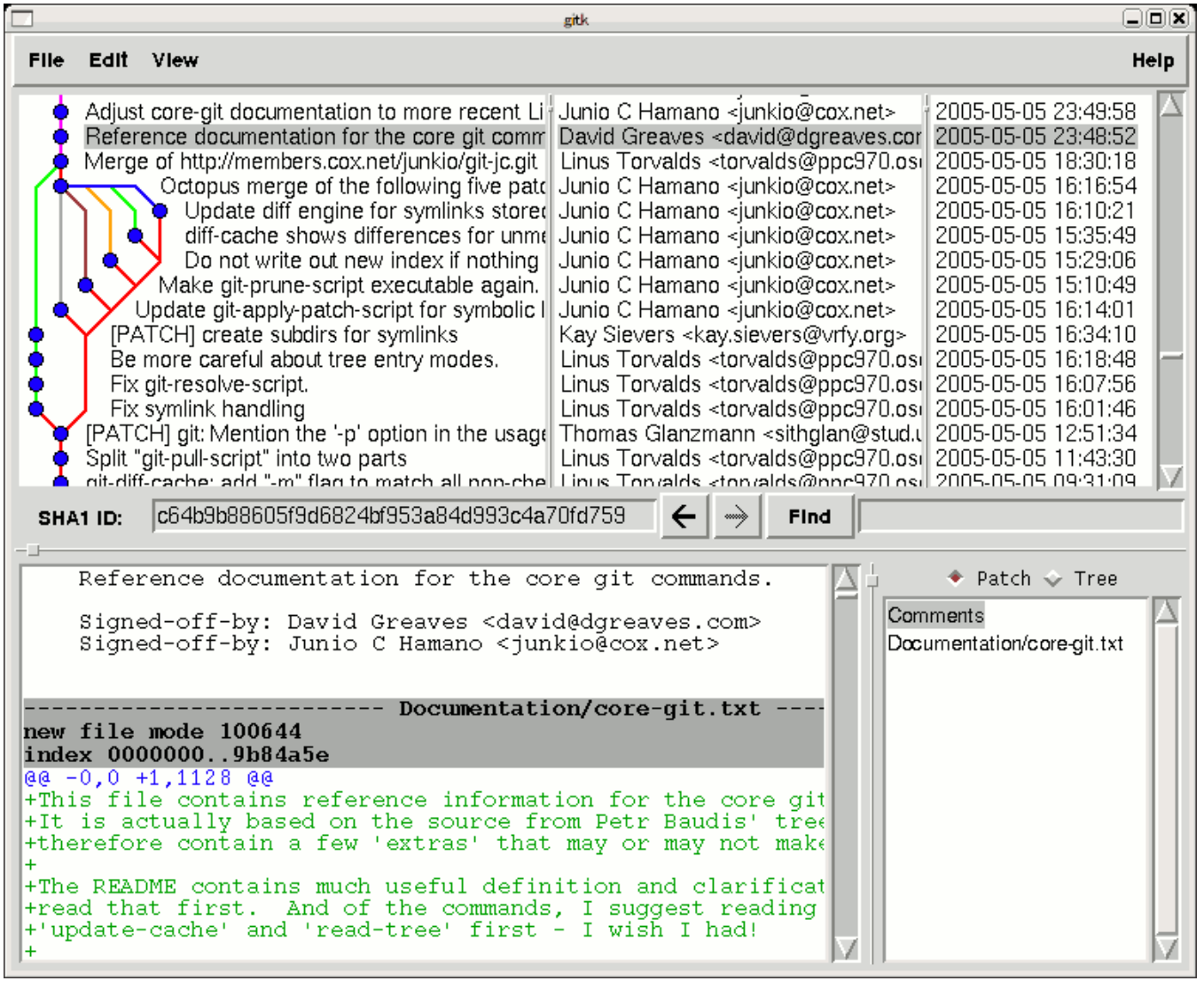
History Visualization (履歴の可視化)



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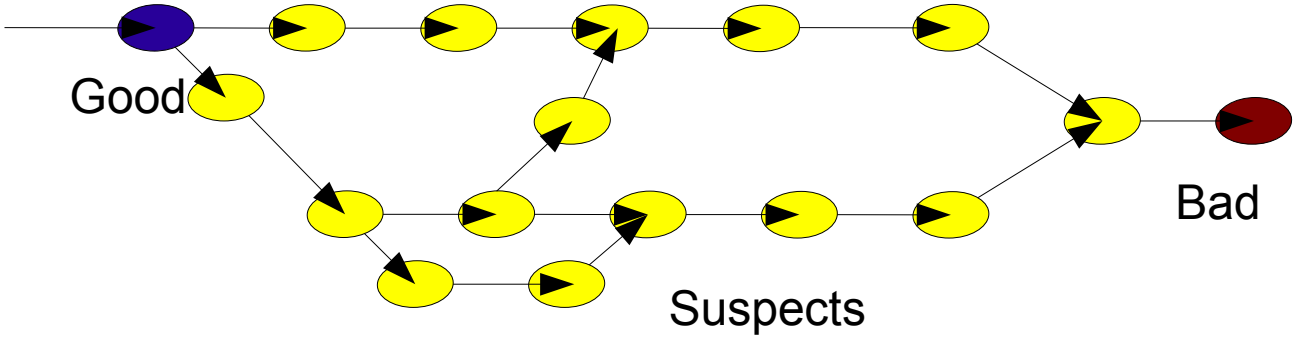
Bisection (二分探索)



- “It used to work but now it doesn't!”
- There is a bug somewhere “between these two revisions”, but where? (どこでこわしたの？)
- Non-linear nature of the history makes things a bit complex.

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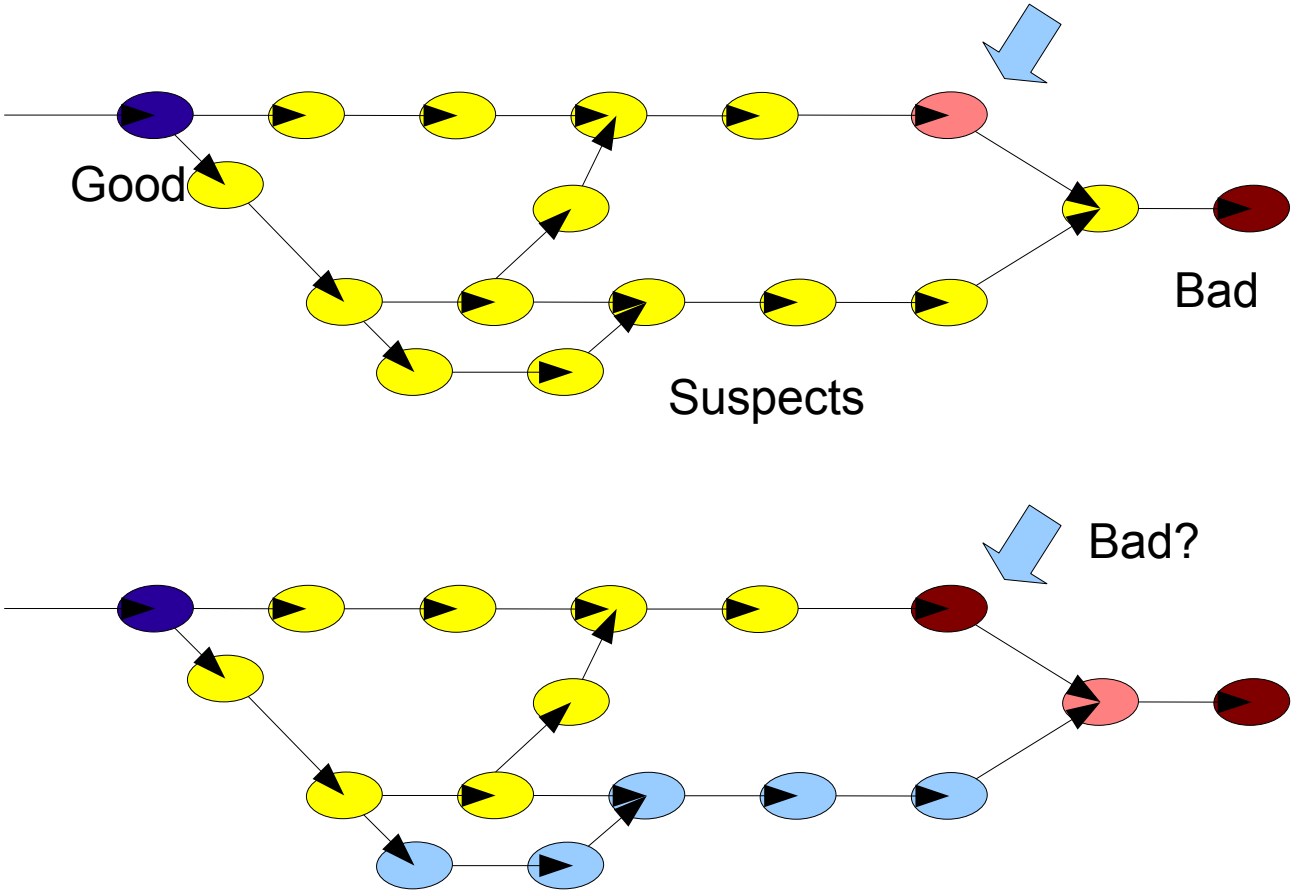
Bisection (cont'd)



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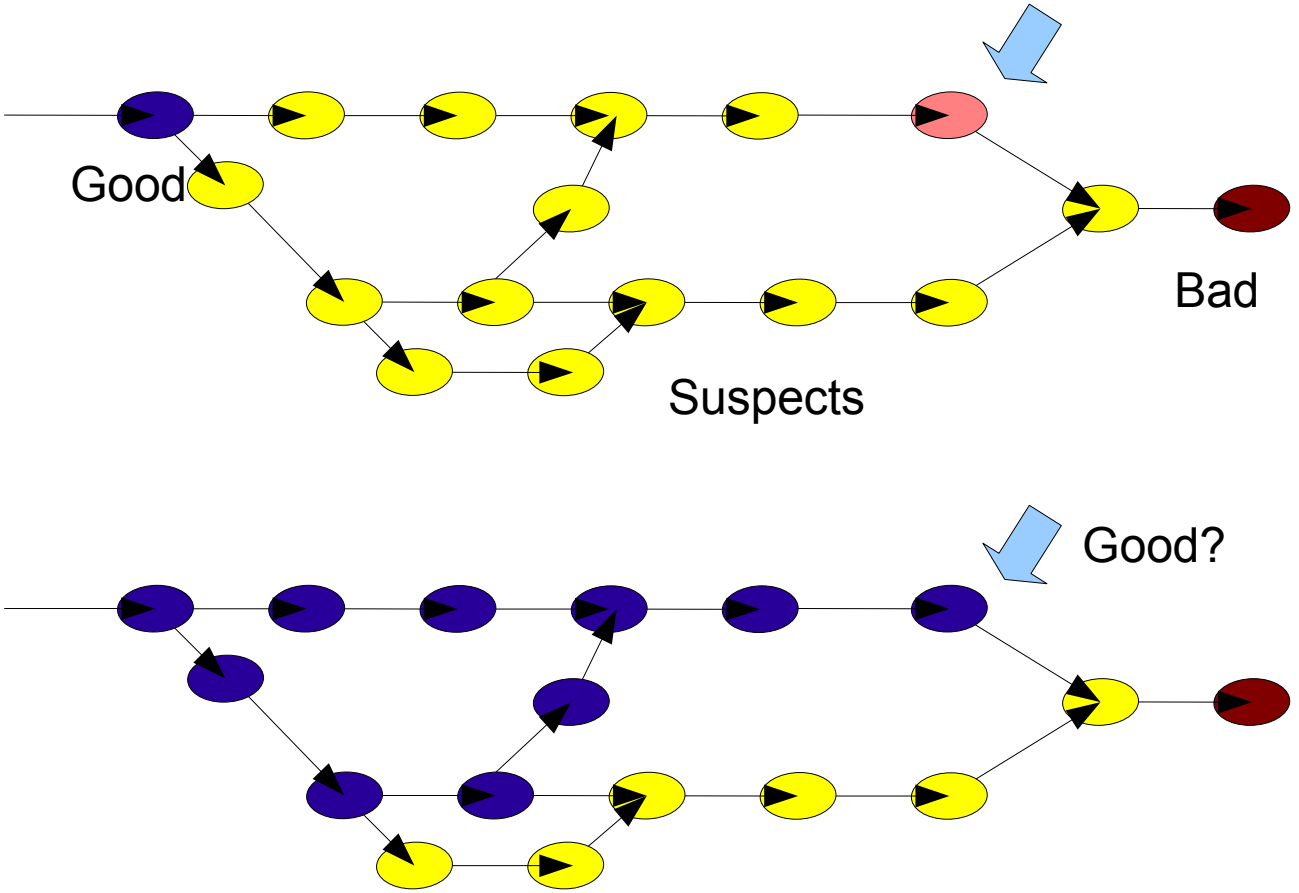

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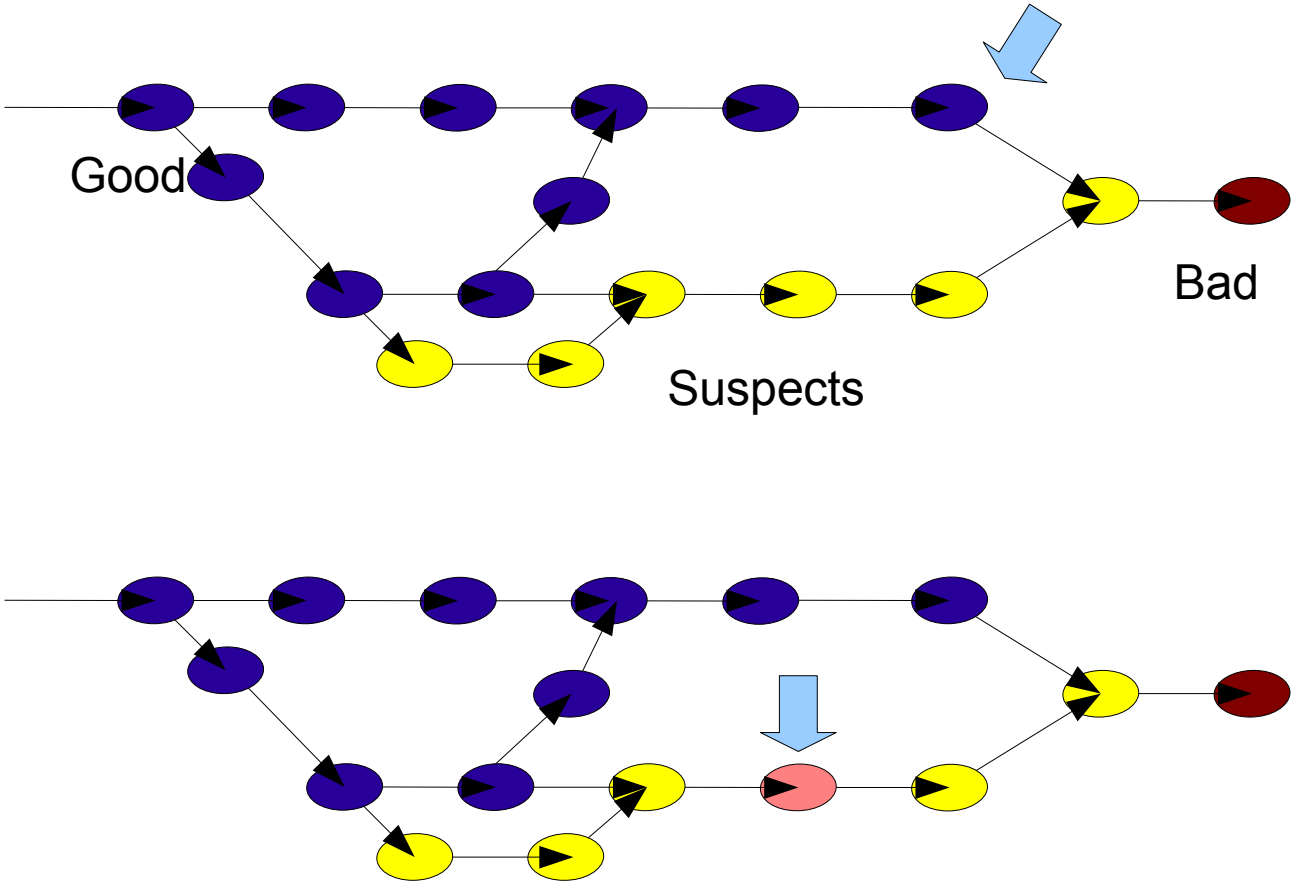

- Recursively narrow down the suspects, until the guilty change is found.

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Demonstration

- Cloning the kernel repository.
- Digging around.
- Making changes on a topic branch.
- Committing.
- Formatting patch for submission.
- Applying an e-mailed patch.
- Pulling and merging upstream changes.

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```
: nnisry; ls -l my-2.6
ls: my-2.6: No such file or directory
: nnisry; git clone git://git.kernel.org/pub/scm/linux/kernel/git/torvalds/linux-
2.6.git/ my-2.6
Checking files out.../s)
 100% (19549/19549) done
: nnisry; cd my-2.6
: nnisry; ls
./       CREDITS         .git/       Kbuild       mm/              security/
../      crypto/         .gitignore  kernel/      net/             sound/
arch/    Documentation/  include/    lib/         README           usr/
block/   drivers/        init/       MAINTAINERS  REPORTING-BUGS
COPYING  fs/             ipc/        Makefile     scripts/
: nnisry; gitk
: nnisry; git checkout -b via8236 master
: nnisry; git show-branch
! [master] fix non-leader exec under ptrace
 ! [origin] fix non-leader exec under ptrace
  * [via8236] fix non-leader exec under ptrace
---
++* [master] fix non-leader exec under ptrace
: nnisry;
```

Clone

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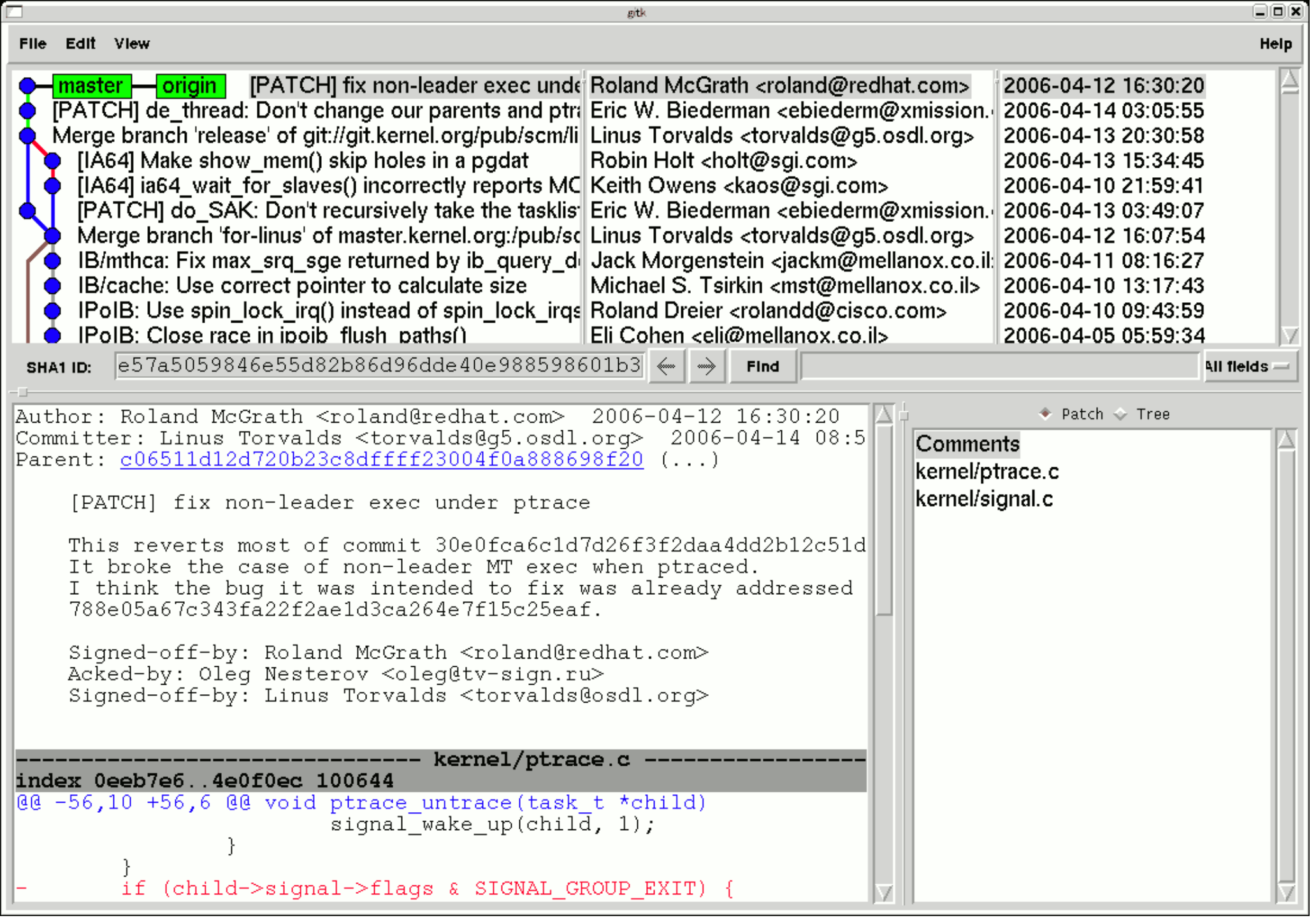

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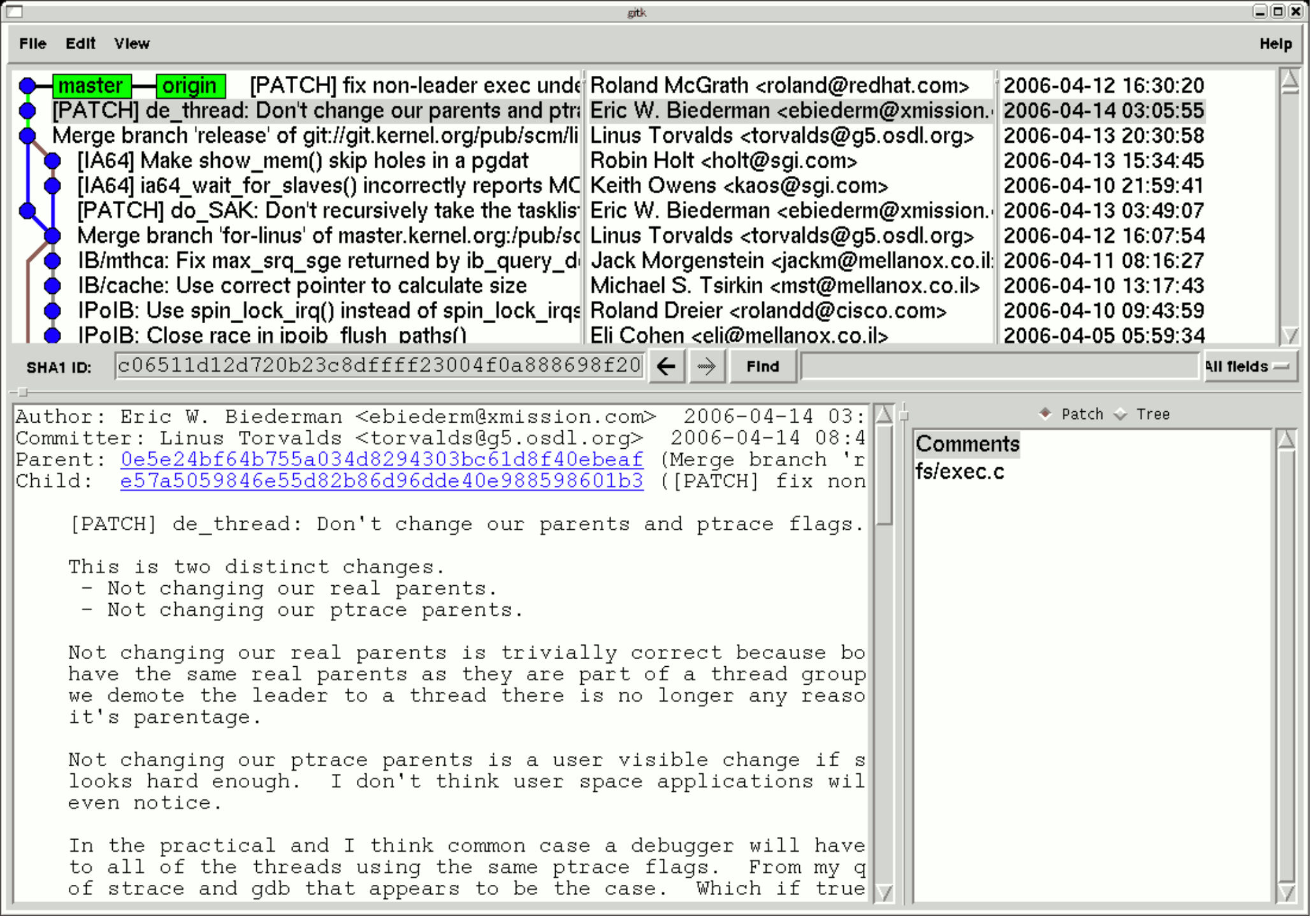

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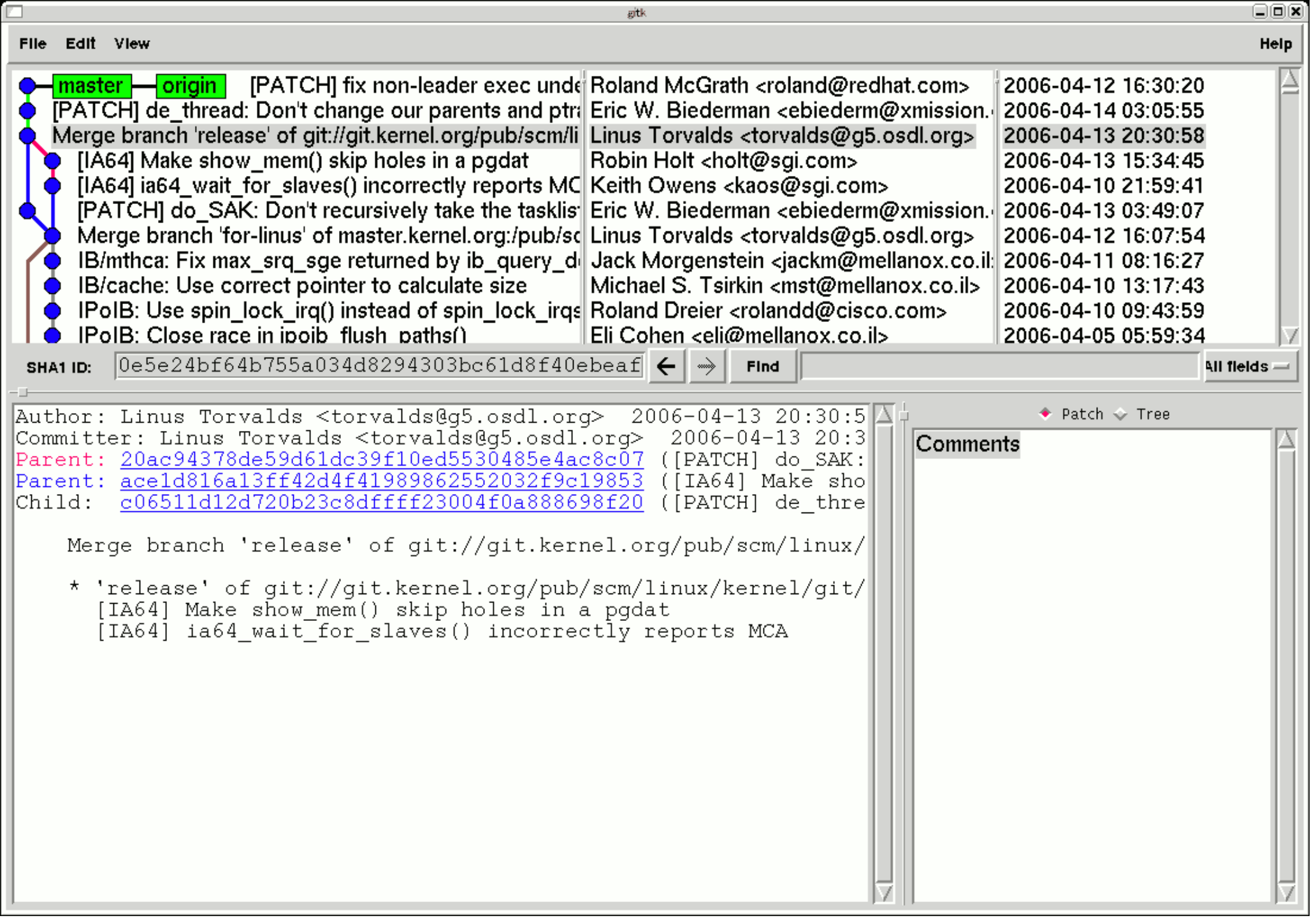

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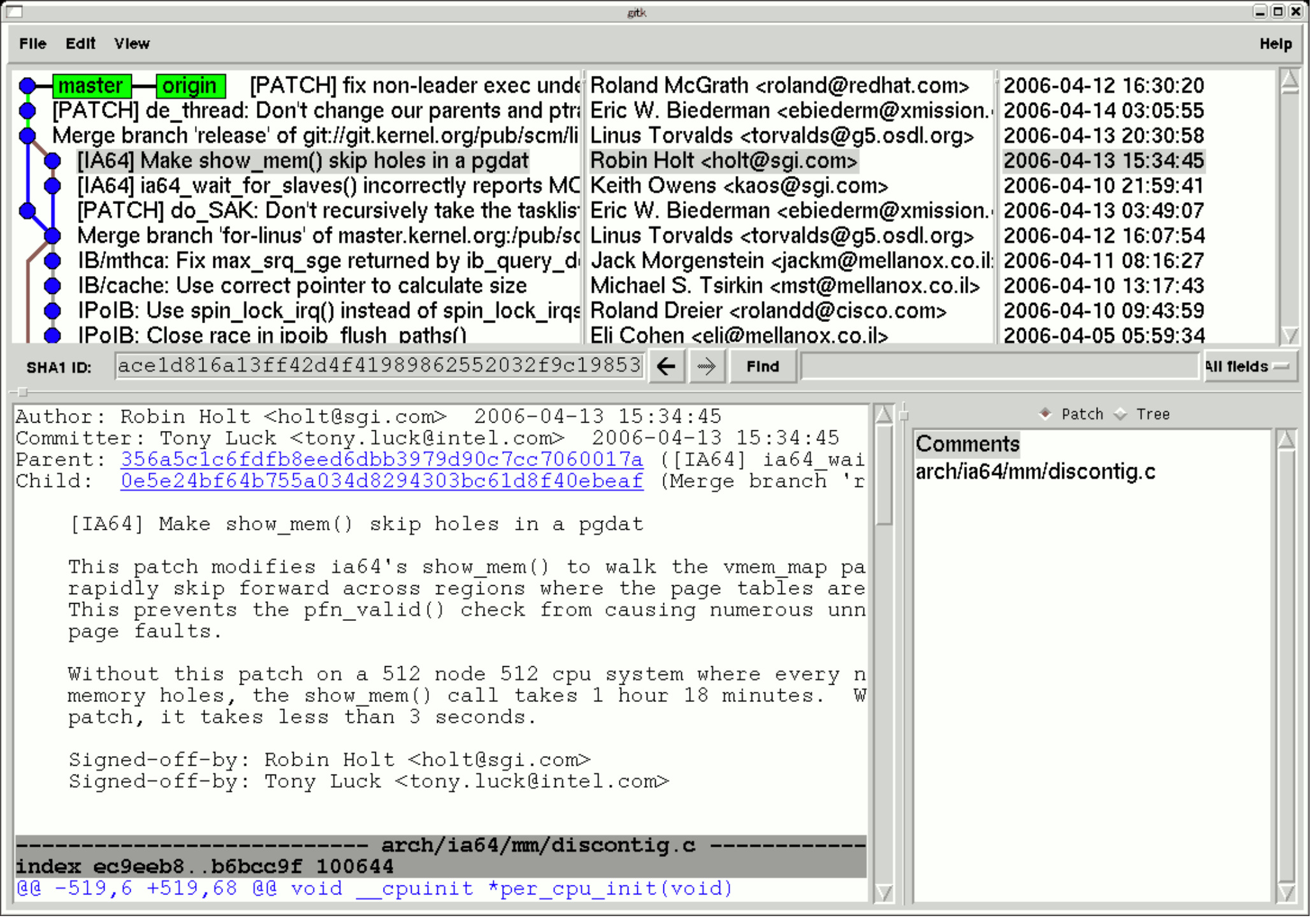

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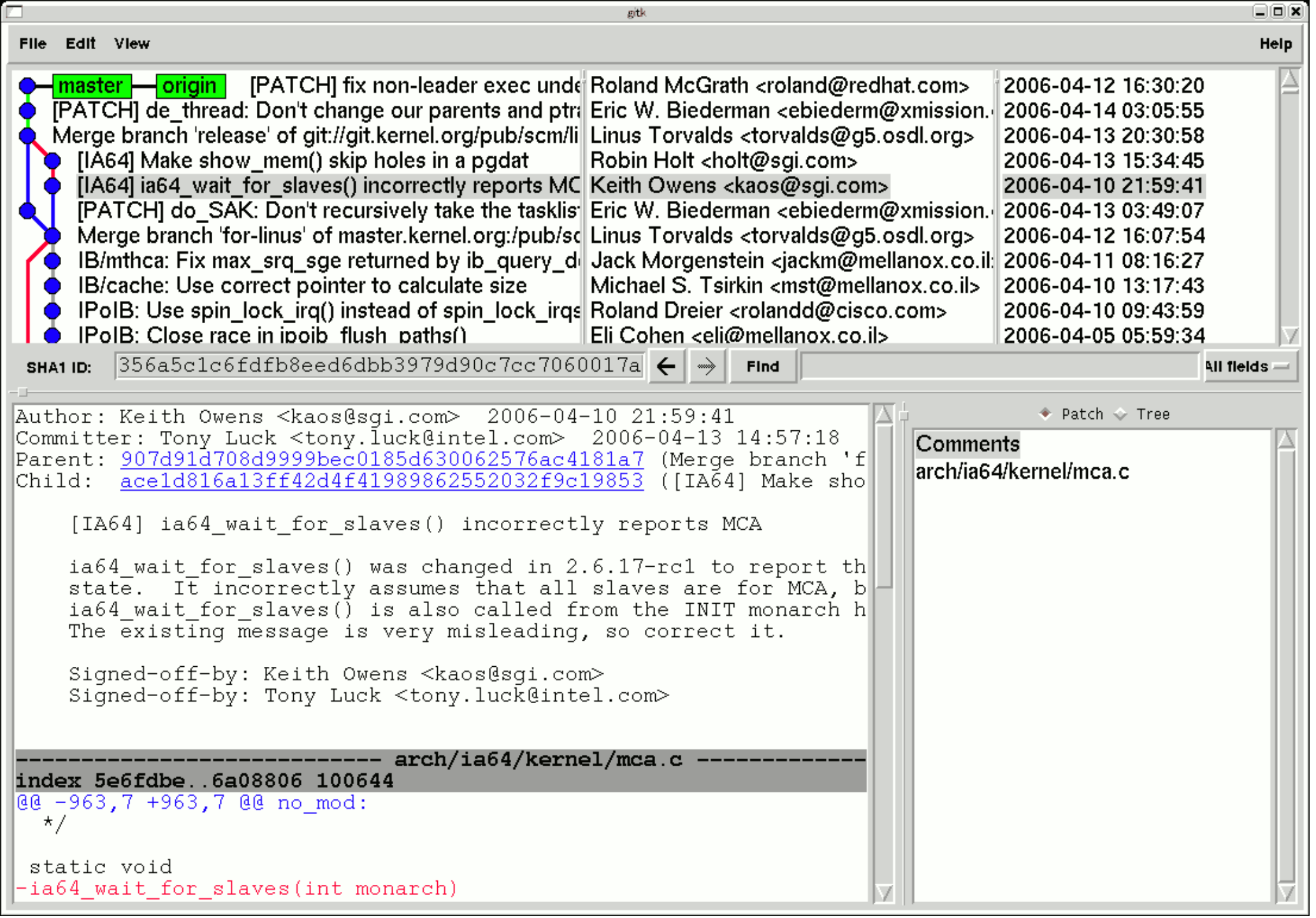

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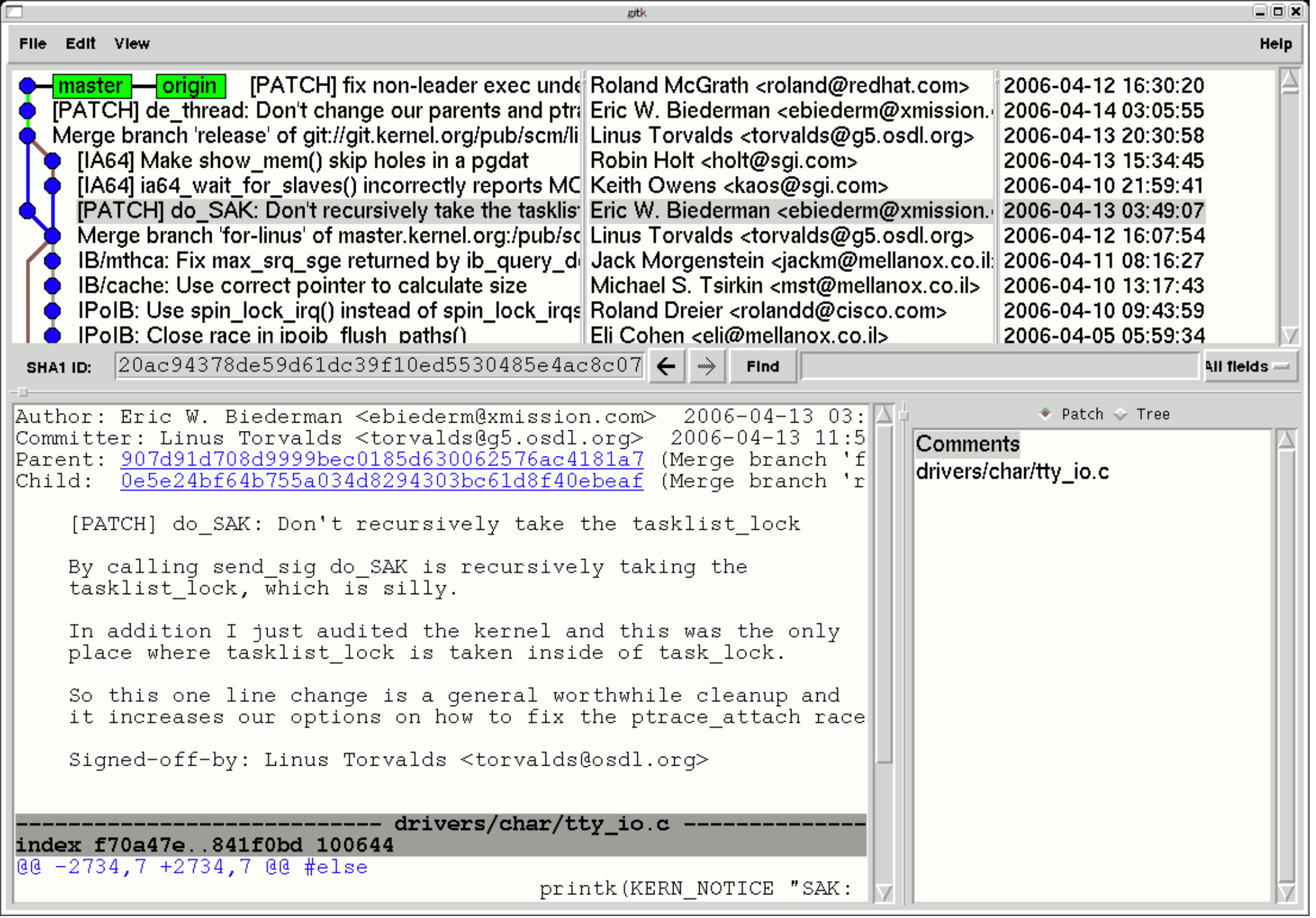

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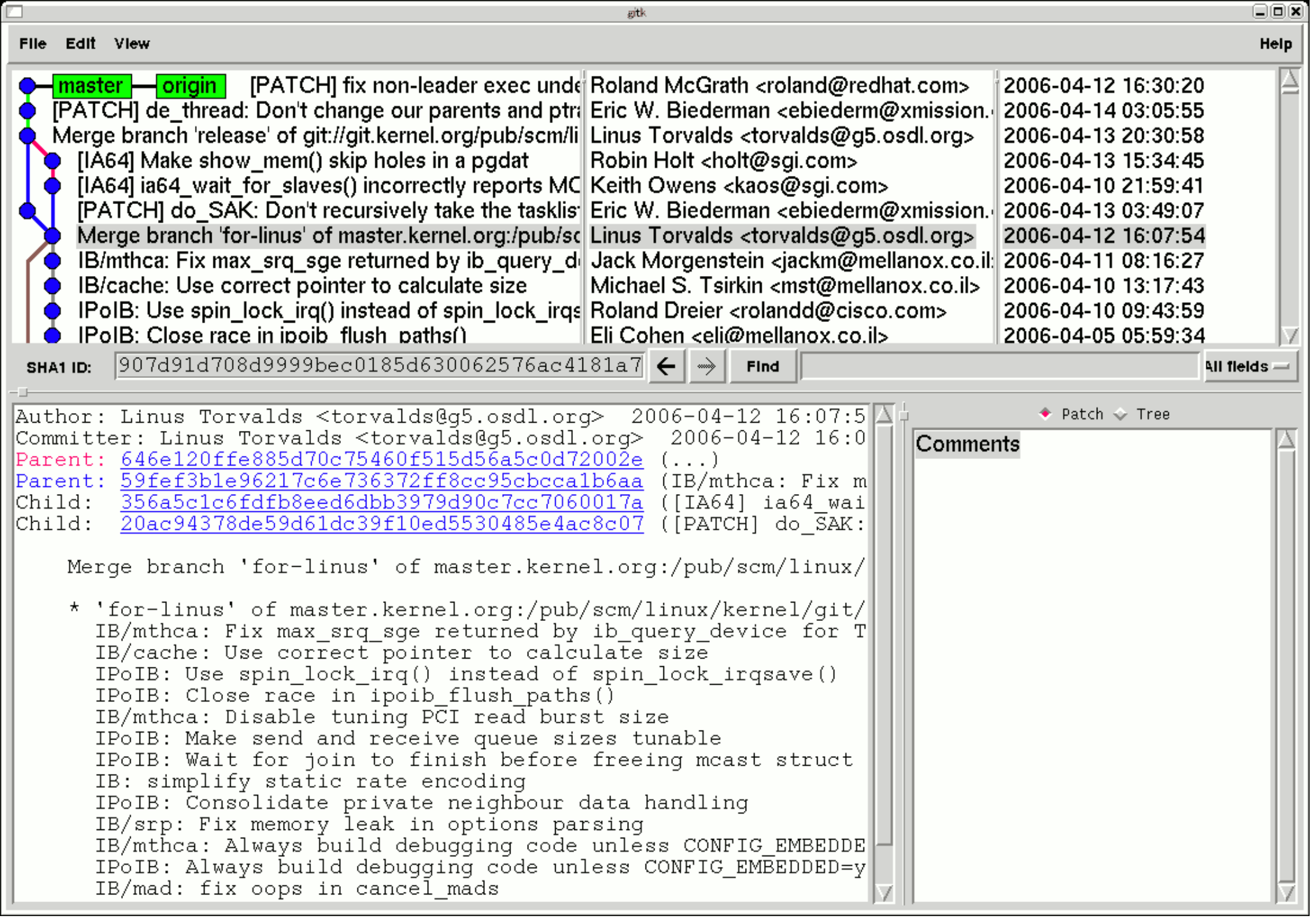

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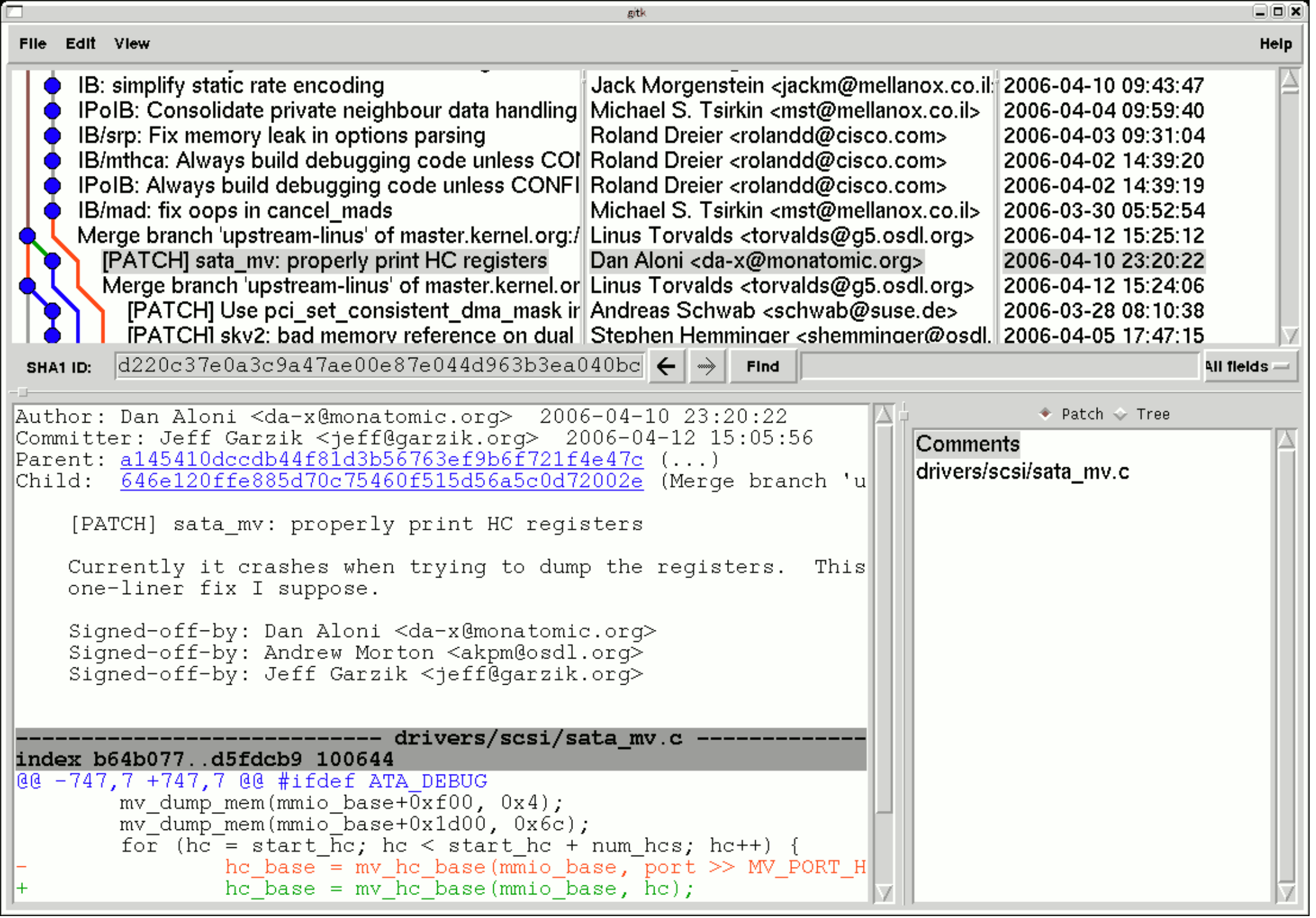

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```
: nnisry; vi +591 arch/i386/pci/irq.c
: nnisry; vi +1272 include/linux/pci_ids.h
: nnisry; git diff
diff --git a/arch/i386/pci/irq.c b/arch/i386/pci/irq.c
index 3ca59ca..5d8c135 100644
--- a/arch/i386/pci/irq.c
+++ b/arch/i386/pci/irq.c
@@ -589,6 +589,7 @@ static __init int via_router_probe(struc
        case PCI_DEVICE_ID_VIA_82C686:
        case PCI_DEVICE_ID_VIA_8231:
        case PCI_DEVICE_ID_VIA_8235:
+       case PCI_DEVICE_ID_VIA_8236:
                /* FIXME: add new ones for 8233/5 */
                r->name = "VIA";
                r->get = pirq_via_get;
diff --git a/include/linux/pci_ids.h b/include/linux/pci_ids.h
index 870fe38..047598c 100644
--- a/include/linux/pci_ids.h
+++ b/include/linux/pci_ids.h
@@ -1270,6 +1270,7 @@ #define PCI_DEVICE_ID_VIA_XN266          0x3156
 #define PCI_DEVICE_ID_VIA_6410         0x3164
 #define PCI_DEVICE_ID_VIA_8754C_0      0x3168
 #define PCI_DEVICE_ID_VIA_8235         0x3177
+#define PCI_DEVICE_ID_VIA_8236         0x3178
 #define PCI_DEVICE_ID_VIA_8385_0       0x3188
 #define PCI_DEVICE_ID_VIA_8377_0       0x3189
 #define PCI_DEVICE_ID_VIA_8378_0       0x3205
: nnisry; git commit -a -v -s
```

Edit

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```
[i386] pci/irq: add VIA 8236

Fictional VIA 8236 is the same as 8235 but with a different ID.

Signed-off-by: Junio C Hamano <junio@twinsun.com>

# Please enter the commit message for your changes.
# (Comment lines starting with '#' will not be included)
# On branch refs/heads/via8236
#
# Updated but not checked in:
#   (will commit)
#
#       modified: arch/i386/pci/irq.c
#       modified: include/linux/pci_ids.h
#
diff --git a/arch/i386/pci/irq.c b/arch/i386/pci/irq.c
index 3ca59ca..5d8c135 100644
--- a/arch/i386/pci/irq.c
+++ b/arch/i386/pci/irq.c
@@ -589,6 +589,7 @@ static __init int via_router_probe(struc
...
```

Commit

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```
: nnisry; git show
commit 774756075cd17b9bb010025673a2e637fdfffcf2
Author: Junio C Hamano <junio@twinsun.com>
Date:   Mon May 29 12:27:03 2006 -0700

    [i386] pci/irq: add VIA 8236

    Fictional VIA 8236 is the same as 8235 but with a different ID.

    Signed-off-by: Junio C Hamano <junio@twinsun.com>

diff --git a/arch/i386/pci/irq.c b/arch/i386/pci/irq.c
index 3ca59ca..5d8c135 100644
--- a/arch/i386/pci/irq.c
+++ b/arch/i386/pci/irq.c
@@ -589,6 +589,7 @@ static __init int via_router_probe(struc
        case PCI_DEVICE_ID_VIA_82C686:
        case PCI_DEVICE_ID_VIA_8231:
        case PCI_DEVICE_ID_VIA_8235:
+       case PCI_DEVICE_ID_VIA_8236:
                /* FIXME: add new ones for 8233/5 */
                r->name = "VIA";
                r->get = pirq_via_get;
diff --git a/include/linux/pci_ids.h b/include/linux/pci_ids.h
index 870fe38..047598c 100644
--- a/include/linux/pci_ids.h
+++ b/include/linux/pci_ids.h
...
: nnisry;
```

Show

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```
: nnisry; git grep -n -e 'DEVICE_ID_VIA_823[56]' -- arch/i386 include/linux
arch/i386/pci/irq.c:572:                case PCI_DEVICE_ID_VIA_8235:
arch/i386/pci/irq.c:577:                        device = PCI_DEVICE_ID_VIA_8235;
arch/i386/pci/irq.c:591:        case PCI_DEVICE_ID_VIA_8235:
arch/i386/pci/irq.c:592:        case PCI_DEVICE_ID_VIA_8236:
include/linux/pci_ids.h:1272:#define PCI_DEVICE_ID_VIA_8235             0x3177
include/linux/pci_ids.h:1273:#define PCI_DEVICE_ID_VIA_8236             0x3178
: nnisry; vi +572 arch/i386/pci/irq.c
: nnisry; git commit -a --amend
[i386] pci/irq: add VIA 8236

Fictional VIA 8236 is the same as 8235 but with a different ID.
While we are at it, simplify logic for via_router_probe().

Signed-off-by: Junio C Hamano <junio@twinsun.com>

# On branch refs/heads/via8236
#
# Updated but not checked in:
#   (will commit)
#
#       modified: arch/i386/pci/irq.c
#       modified: include/linux/pci_ids.h
#
```

Grep & Amend

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```
: nnisry; git show-branch
! [master] fix non-leader exec under ptrace
 ! [origin] fix non-leader exec under ptrace
  * [via8236] [i386] pci/irq: add VIA 8236
---
  * [via8236] [i386] pci/irq: add VIA 8236
++* [master] fix non-leader exec under ptrace
: nnisry; git format-patch master..
0001-i386-pci-irq-add-VIA-8236.txt
```

format-patch

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```
: nnisry; cat 0001-i386-pci-irq-add-VIA-8236.txt
From 94a0a8e90d6a1875709be62b90da390524cad960 Mon Sep 17 00:00:00 2001
From: Junio C Hamano <junio@twinsun.com>
Date: Mon, 29 May 2006 12:27:03 -0700
Subject: [PATCH] [i386] pci/irq: add VIA 8236

Fictional VIA 8236 is the same as 8235 but with a different ID.
While we are at it, simplify logic for via_router_probe().

Signed-off-by: Junio C Hamano <junio@twinsun.com>
---
 arch/i386/pci/irq.c     |   11 +++++++------
 include/linux/pci_ids.h |    1 +
 2 files changed, 6 insertions(+), 6 deletions(-)

diff --git a/arch/i386/pci/irq.c b/arch/i386/pci/irq.c
index 3ca59ca..e60997e 100644
--- a/arch/i386/pci/irq.c
+++ b/arch/i386/pci/irq.c
@@ -563,18 +563,16 @@ static __init int via_router_probe(struc
        if (device == PCI_DEVICE_ID_VIA_82C586_0) {
                switch(router->device) {
                case PCI_DEVICE_ID_VIA_82C686:
+               case PCI_DEVICE_ID_VIA_8235:
+               case PCI_DEVICE_ID_VIA_8236:
                        /*
...
```

format-patch

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```
: nnisry; cat ../material/patch01.diff
From 20ddf0f9be7552782e5d68978bd1faf11bb00bd1 Mon Sep 17 00:00:00 2001
From: A U Thor <author@example.com>
Date: Sun, 28 May 2006 15:36:23 -0700
Subject: [PATCH] dmi_scan.c: end comment sentence with a full stop

Signed-off-by: A U Thor <author@example.com>
---
 arch/i386/kernel/dmi_scan.c |    2 +-
 1 files changed, 1 insertions(+), 1 deletions(-)

diff --git a/arch/i386/kernel/dmi_scan.c b/arch/i386/kernel/dmi_scan.c
index 5efceeb..5dcc7a4 100644
--- a/arch/i386/kernel/dmi_scan.c
+++ b/arch/i386/kernel/dmi_scan.c
@@ -34,7 +34,7 @@ static char * __init dmi_string(struct d

 /*
  *     We have to be cautious here. We have seen BIOSes with DMI pointers
- *     pointing to completely the wrong place for example
+ *     pointing to completely the wrong place for example.
  */
 static int __init dmi_table(u32 base, int len, int num,
                             void (*decode)(struct dmi_header *))
--
1.3.3.g47e6

: nnisry;
```

am (apply mbox)

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```
: nnisry; git grep -e 'the wrong place for example$' -- arch/i386/kernel
arch/i386/kernel/dmi_scan.c: *  pointing to completely the wrong place for example
: nnisry; git grep -e 'the wrong place for example$' v2.6.12 -- arch/i386/kernel
v2.6.12:arch/i386/kernel/dmi_scan.c: *  pointing to completely the wrong place for
example
: nnisry; git checkout -b spell master
: nnisry; git am ../material/patch01.diff

Applying 'dmi_scan.c: end comment sentence with a full stop'

Wrote tree 12788183af913c8a0bb864457f3b4e24c8524fa7
Committed: b50a7915e8f2282b62ff40e89744636ccee57810
: nnisry; git show-branch
! [master] fix non-leader exec under ptrace
 ! [origin] fix non-leader exec under ptrace
  * [spell] dmi_scan.c: end comment sentence with a full stop
   ! [via8236] [i386] pci/irq: add VIA 8236
----
  *  [spell] dmi_scan.c: end comment sentence with a full stop
   + [via8236] [i386] pci/irq: add VIA 8236
++*+ [master] fix non-leader exec under ptrace
: nnisry; git reset --hard HEAD^
: nnisry; git show-branch
! [master] fix non-leader exec under ptrace
 ! [origin] fix non-leader exec under ptrace
  * [spell] fix non-leader exec under ptrace
   ! [via8236] [i386] pci/irq: add VIA 8236
----
   + [via8236] [i386] pci/irq: add VIA 8236
++*+ [master] fix non-leader exec under ptrace
```

am (apply mbox)

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```
: nnisry; git am -s -i ../material/patch01.diff
Commit Body is:
--------------------------
dmi_scan.c: end comment sentence with a full stop

Signed-off-by: A U Thor <author@example.com>
Signed-off-by: Junio C Hamano <junio@twinsun.com>
--------------------------
Apply? [y]es/[n]o/[e]dit/[v]iew patch/[a]ccept all e

dmi_scan.c: end comment sentence with a full stop.

Signed-off-by: A U Thor <author@example.com>
Signed-off-by: Junio C Hamano <junio@twinsun.com>
~
~
.dotest/final-commit: 4 lines, 147 characters.
Commit Body is:
--------------------------
dmi_scan.c: end comment sentence with a full stop.

Signed-off-by: A U Thor <author@example.com>
Signed-off-by: Junio C Hamano <junio@twinsun.com>
--------------------------
Apply? [y]es/[n]o/[e]dit/[v]iew patch/[a]ccept all y

Applying 'dmi_scan.c: end comment sentence with a full stop'

Wrote tree 12788183af913c8a0bb864457f3b4e24c8524fa7
Committed: 49a75c18f483d1d986ff3d44564caeeefddb6af2
: nnisry;
```

am (apply mbox)

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```
: nnisry; git checkout -b test master
: nnisry; git branch
  master
  origin
  spell
* test
  via8236
: nnisry; git pull . via8236 spell
Trying simple merge with 94a0a8e90d6a1875709be62b90da390524cad960
Trying simple merge with 49a75c18f483d1d986ff3d44564caeeefddb6af2
Merge 11d7228fc4ce9be762bcd8fe71050c8e42c0dab3, made by octopus.
 arch/i386/kernel/dmi_scan.c |    2 +-
 arch/i386/pci/irq.c         |   11 +++++++------
 include/linux/pci_ids.h     |    1 +
 3 files changed, 7 insertions(+), 7 deletions(-)
: nnisry; git show-branch
! [master] fix non-leader exec under ptrace
 ! [origin] fix non-leader exec under ptrace
  ! [spell] dmi_scan.c: end comment sentence with a full stop.
   * [test] Merge branches 'via8236' and 'spell' into test
    ! [via8236] [i386] pci/irq: add VIA 8236
-----
   -  [test] Merge branches 'via8236' and 'spell' into test
  +*  [spell] dmi_scan.c: end comment sentence with a full stop.
   *+ [via8236] [i386] pci/irq: add VIA 8236
+++*+ [master] fix non-leader exec under ptrace
: nnisry; gitk
```

merge

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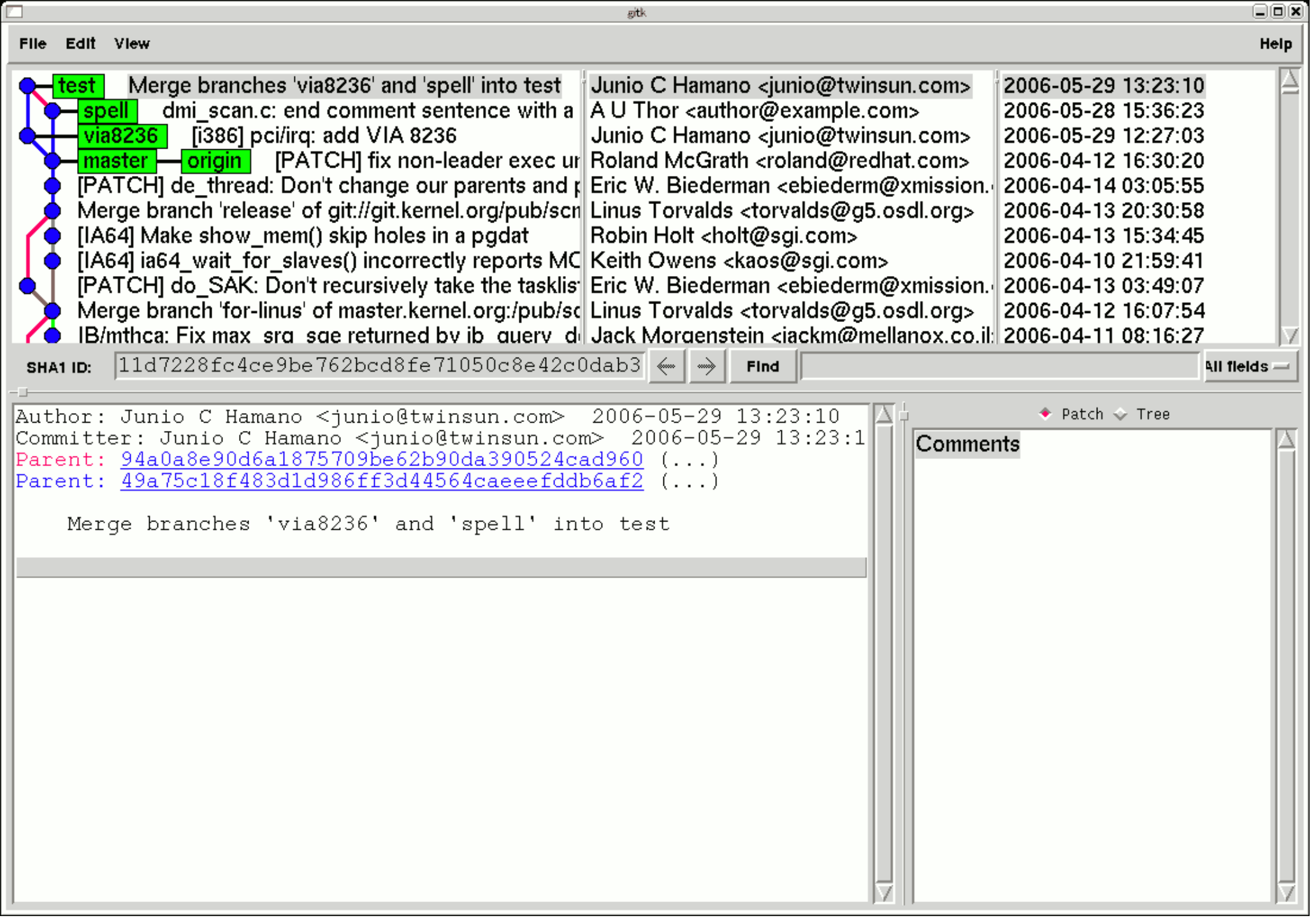

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```
: nnisry; git checkout master
: nnisry; git pull
Unpacking 511 objects
 100% (511/511) done
* refs/heads/origin: fast forward to branch 'master' of git://git.kernel.org/pub/sc...
  from e57a5059846e55d82b86d96dde40e988598601b3 to 11f16971ceeb0f442e58f318b0cfde8e...
Updating from e57a5059846e55d82b86d96dde40e988598601b3 to 11f16971ceeb0f442e58f318b...
Fast forward
 Documentation/DMA-API.txt                          |   49 +-
 Documentation/DMA-mapping.txt                      |   22 +
 Documentation/i2c/busses/i2c-parport               |   16 -
 ...
 include/linux/usb/net2280.h                        |  444 ++++++++++++++++
 kernel/power/pm.c                                  |   20 -
 lib/kobject.c                                      |    1
 scripts/kconfig/lxdialog/checklist.c               |   19 -
 106 files changed, 2627 insertions(+), 1070 deletions(-)
 rename arch/i386/kernel/dmi_scan.c => drivers/firmware/dmi_scan.c (98%)
 create mode 100644 drivers/usb/host/pci-quirks.h
 create mode 100644 drivers/usb/input/usbtouchscreen.c
 create mode 100644 drivers/usb/serial/funsoft.c
 create mode 100644 include/linux/usb/net2280.h
: nnisry;
```

update

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```
: nnisry; git checkout test
: nnisry; git pull . master
Trying really trivial in-index merge...
fatal: Merge requires file-level merging
Nope.
Merging HEAD with 11f16971ceeb0f442e58f318b0cfde8eb35296bb
Merging:
11d7228fc4ce9be762bcd8fe71050c8e42c0dab3 Merge branches 'via8236' and 'spell' into test
11f16971ceeb0f442e58f318b0cfde8eb35296bb Merge
master.kernel.org:/pub/scm/linux\/kernel/git/gregkh/i2c-2.6
found 1 common ancestor(s):
e57a5059846e55d82b86d96dde40e988598601b3 [PATCH] fix non-leader exec under ptrace
Renaming arch/i386/kernel/dmi_scan.c => drivers/firmware/dmi_scan.c
Auto-merging drivers/firmware/dmi_scan.c
Auto-merging include/linux/pci_ids.h
Auto-merging arch/i386/pci/irq.c
CONFLICT (content): Merge conflict in arch/i386/pci/irq.c

Automatic merge failed; fix conflicts and then commit the result.
: nnisry;
```

merge

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```
: nnisry; git diff MERGE_HEAD -- drivers/firmware/dmi_scan.c
diff --git a/drivers/firmware/dmi_scan.c b/drivers/firmware/dmi_scan.c
index 948bd7e..1637cd6 100644
--- a/drivers/firmware/dmi_scan.c
+++ b/drivers/firmware/dmi_scan.c
@@ -34,7 +34,7 @@ static char * __init dmi_string(struct d

 /*
  *     We have to be cautious here. We have seen BIOSes with DMI pointers
- *     pointing to completely the wrong place for example
+ *     pointing to completely the wrong place for example.
  */
 static int __init dmi_table(u32 base, int len, int num,
                             void (*decode)(struct dmi_header *))
: nnisry; git diff MERGE_HEAD -- include/linux/pci_ids.h
diff --git a/include/linux/pci_ids.h b/include/linux/pci_ids.h
index 8d03e10..f491c37 100644
--- a/include/linux/pci_ids.h
+++ b/include/linux/pci_ids.h
@@ -1271,6 +1271,7 @@ #define PCI_DEVICE_ID_VIA_XN266          0x3156
 #define PCI_DEVICE_ID_VIA_6410          0x3164
 #define PCI_DEVICE_ID_VIA_8754C_0       0x3168
 #define PCI_DEVICE_ID_VIA_8235          0x3177
+#define PCI_DEVICE_ID_VIA_8236          0x3178
 #define PCI_DEVICE_ID_VIA_8385_0        0x3188
 #define PCI_DEVICE_ID_VIA_8377_0        0x3189
 #define PCI_DEVICE_ID_VIA_8378_0        0x3205
```

merge

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```
: nnisry; git diff
diff --cc arch/i386/pci/irq.c
index e60997e,7323544..0000000
--- a/arch/i386/pci/irq.c
+++ b/arch/i386/pci/irq.c
@@@ -586,8 -588,10 +586,14 @@@
         case PCI_DEVICE_ID_VIA_82C596:
         case PCI_DEVICE_ID_VIA_82C686:
         case PCI_DEVICE_ID_VIA_8231:
+        case PCI_DEVICE_ID_VIA_8233A:
         case PCI_DEVICE_ID_VIA_8235:
++<<<<<<< HEAD/arch/i386/pci/irq.c
 +       case PCI_DEVICE_ID_VIA_8236:
++=======
+        case PCI_DEVICE_ID_VIA_8237:
+        case PCI_DEVICE_ID_VIA_8237_SATA:
++>>>>>>> 11f16971ceeb0f442e58f318b0cfde8eb35296bb/arch/i386/pci/irq.c
                 /* FIXME: add new ones for 8233/5 */
                 r->name = "VIA";
                 r->get = pirq_via_get;
: nnisry; vi +590 arch/i386/pci/irq.c
```

merge

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```
: nnisry; vi +590 arch/i386/pci/irq.c
: nnisry; git diff
diff --cc arch/i386/pci/irq.c
index e60997e,7323544..0000000
--- a/arch/i386/pci/irq.c
+++ b/arch/i386/pci/irq.c
@@@ -586,8 -588,10 +586,11 @@@
        case PCI_DEVICE_ID_VIA_82C596:
        case PCI_DEVICE_ID_VIA_82C686:
        case PCI_DEVICE_ID_VIA_8231:
+       case PCI_DEVICE_ID_VIA_8233A:
        case PCI_DEVICE_ID_VIA_8235:
 +      case PCI_DEVICE_ID_VIA_8236:
+       case PCI_DEVICE_ID_VIA_8237:
+       case PCI_DEVICE_ID_VIA_8237_SATA:
                /* FIXME: add new ones for 8233/5 */
                r->name = "VIA";
                r->get = pirq_via_get;
```

merge

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```
: nnisry; git commit -a -s

Merge branch 'master' into test

Conflicts:

        arch/i386/pci/irq.c (trivial - kept our via8236 changes)

Signed-off-by: Junio C Hamano <junio@twinsun.com>
# It looks like you may be committing a MERGE.
# If this is not correct, please remove the file
#       .git/MERGE_HEAD
# and try again
#

# Please enter the commit message for your changes.
# (Comment lines starting with '#' will not be included)
# On branch refs/heads/test
#
# Updated but not checked in:
#   (will commit)
#
#       modified: Documentation/DMA-API.txt
#       modified: Documentation/DMA-mapping.txt
#       modified: Documentation/i2c/busses/i2c-parport
...
```

merge

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```
: nnisry; git show -M
commit a88c3d16810f3e5c83a4573519d4d3c9d428f6fa
Merge: 11d7228... 11f1697...
Author: Junio C Hamano <junio@twinsun.com>
Date:   Mon May 29 13:33:24 2006 -0700

    Merge branch 'master' into test

    Conflicts:

        arch/i386/pci/irq.c (trivial - kept our via8236 changes)

    Signed-off-by: Junio C Hamano <junio@twinsun.com>

diff --cc arch/i386/pci/irq.c
index e60997e,7323544..65e0cef
--- a/arch/i386/pci/irq.c
+++ b/arch/i386/pci/irq.c
@@@ -586,8 -588,10 +586,11 @@@
        case PCI_DEVICE_ID_VIA_82C596:
        case PCI_DEVICE_ID_VIA_82C686:
        case PCI_DEVICE_ID_VIA_8231:
+       case PCI_DEVICE_ID_VIA_8233A:
        case PCI_DEVICE_ID_VIA_8235:
 +      case PCI_DEVICE_ID_VIA_8236:
+       case PCI_DEVICE_ID_VIA_8237:
+       case PCI_DEVICE_ID_VIA_8237_SATA:
                /* FIXME: add new ones for 8233/5 */
                r->name = "VIA";
                r->get = pirq_via_get;
```

merge

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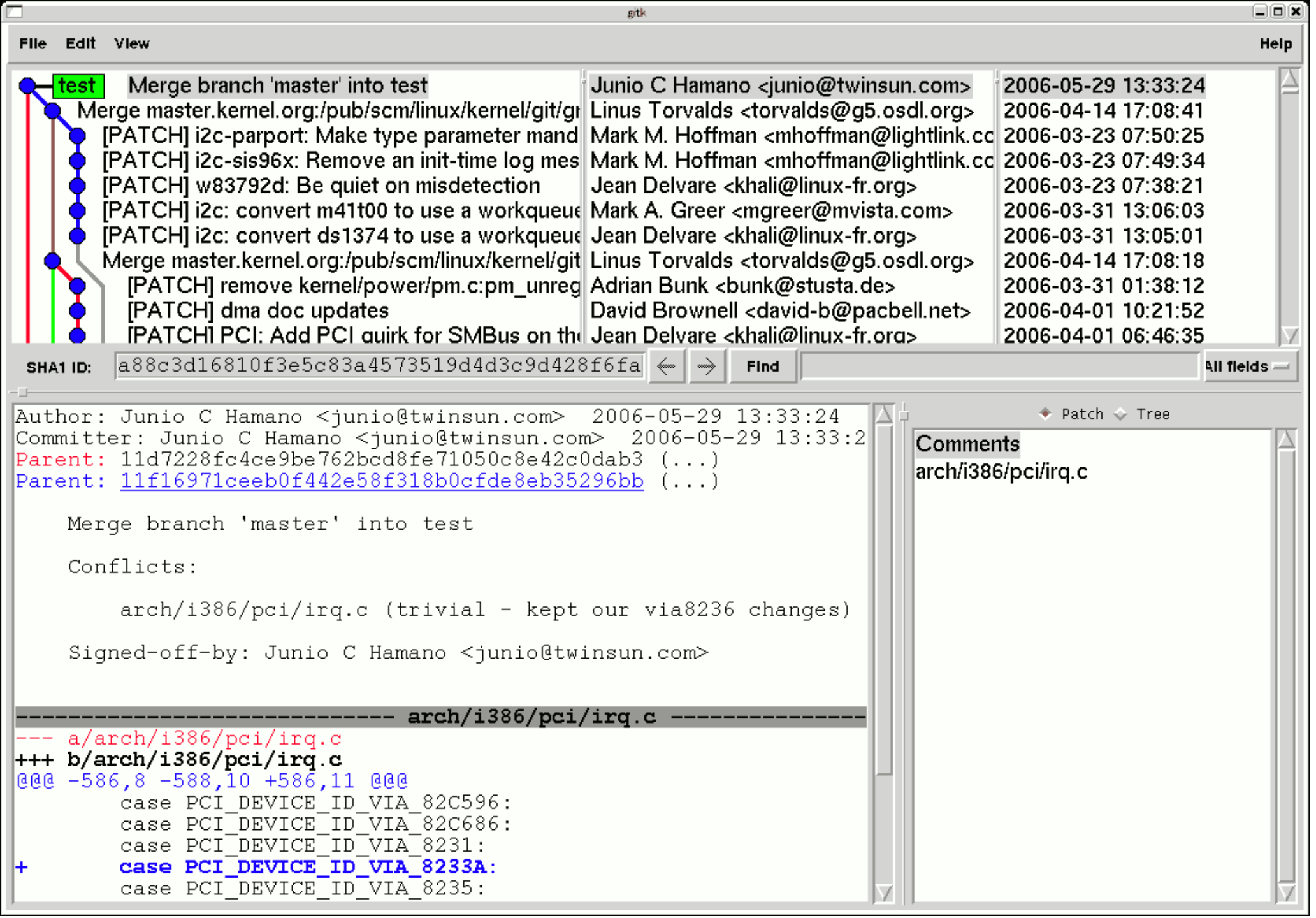

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```
: nnisry; git checkout master
: nnisry; git pull
Unpacking 324 objects
 100% (324/324) done
* refs/heads/origin: fast forward to branch 'master' of git://git.kernel.org/pub/scm/...
  from 11f16971ceeb0f442e58f318b0cfde8eb35296bb to f2f4d9e8cb7d4180ac1830eec49e18fef7...
Updating from 11f16971ceeb0f442e58f318b0cfde8eb35296bb to f2f4d9e8cb7d4180ac1830eec49...
Fast forward
 arch/sparc/kernel/systbls.S          |    2
 arch/sparc64/kernel/sys32.S          |    1
 arch/sparc64/kernel/systbls.S        |    4
 ...
 include/scsi/scsi_devinfo.h          |    1
 include/scsi/scsi_ioctl.h            |    2
 include/scsi/scsi_transport_fc.h     |   41
 48 files changed, 1103 insertions(+), 13273 deletions(-)
 delete mode 100644 drivers/scsi/ibmvscsi/srp.h
 delete mode 100644 drivers/scsi/qlogicfc.c
 delete mode 100644 drivers/scsi/qlogicfc_asm.c
 create mode 100644 drivers/scsi/scsi_sas_internal.h
: nnisry; git checkout test
```

update

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```
: nnisry; git pull . master
Trying really trivial in-index merge...
fatal: Merge requires file-level merging
Nope.
Merging HEAD with f2f4d9e8cb7d4180ac1830eec49e18fef701c58c
Merging:
a88c3d16810f3e5c83a4573519d4d3c9d428f6fa Merge branch 'master' into test
f2f4d9e8cb7d4180ac1830eec49e18fef701c58c Merge master.kernel.org:/pub/scm/linux/ker...
found 1 common ancestor(s):
11f16971ceeb0f442e58f318b0cfde8eb35296bb Merge master.kernel.org:/pub/scm/linux/ker...
Removing drivers/scsi/ibmvscsi/srp.h
Removing drivers/scsi/qlogicfc.c
Removing drivers/scsi/qlogicfc_asm.c

Merge 628c2a7a1a81a6b2e70040f01390cfe95eefc46a, made by recursive.
 arch/sparc/kernel/systbls.S         |    2
 ...
 include/scsi/scsi_ioctl.h           |    2
 include/scsi/scsi_transport_fc.h    |   41
 48 files changed, 1103 insertions(+), 13273 deletions(-)
 delete mode 100644 drivers/scsi/ibmvscsi/srp.h
 delete mode 100644 drivers/scsi/qlogicfc.c
 delete mode 100644 drivers/scsi/qlogicfc_asm.c
 create mode 100644 drivers/scsi/scsi_sas_internal.h
: nnisry; git diff --stat master
 arch/i386/pci/irq.c         |   11 +++++-----
 drivers/firmware/dmi_scan.c |    2 +-
 include/linux/pci_ids.h     |    1 +
 3 files changed, 7 insertions(+), 7 deletions(-)
: nnisry;
```

update

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Introduction to git
(git 入門)

おしまい

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Log Searching (履歴探索)

- Limit change-log output by
  - revision ranges (版番号範囲)

    ```
    git log v2.6.12..v2.6.13-rc1
    ```
  - paths that were changed (変更された範囲)

    ```
    git log — arch/i386 include/asm-i386
    ```
  - hunks of text (変更部が含む文字列)

    ```
    git log -S'<a couple of lines of text>'
    ```
- Combination of all of the above

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